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THE COMPARATIVE MERITS OF THE METHODS EMPLOYED IN THE VARIOUS MASTOID OPERATIONS.*

BY JOSEPH C. BECK, CHICAGO.

Having been assigned by the Chairman to present the subject of "Comparing the Merits of the Various Methods Employed in the Mastoid Operations," and drawing my conclusions therefrom, I have decided to limit myself to three principal operations, namely:

- (a) Simple mastoid operation.
- (b) Semi-radical mastoid operation.
- (c) Radical mastoid operation.

The various complications, as labyrinthitis, sinus thrombosis, meningitis and brain abscess, will not be discussed within the limits of this paper.

I desire to state that my conclusions are based on personal observations, and experience only; consequently, there are a number of methods and modifications of the technic that will not be mentioned, not having employed the same, or, if so, not often enough to have drawn any conclusions from them.

It is not necessary for me to describe before this body of specialists the usual technic of the various operations, inasmuch as that would be superfluous and would be repeating what is well known, or can be found in any modern text book on otology. What I desire to do is to bring out the salient points in the various steps of the

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operations, their modifications, criticise them and mention some steps in the technic that I have been employing with good results, which perhaps are new and may be of interest.

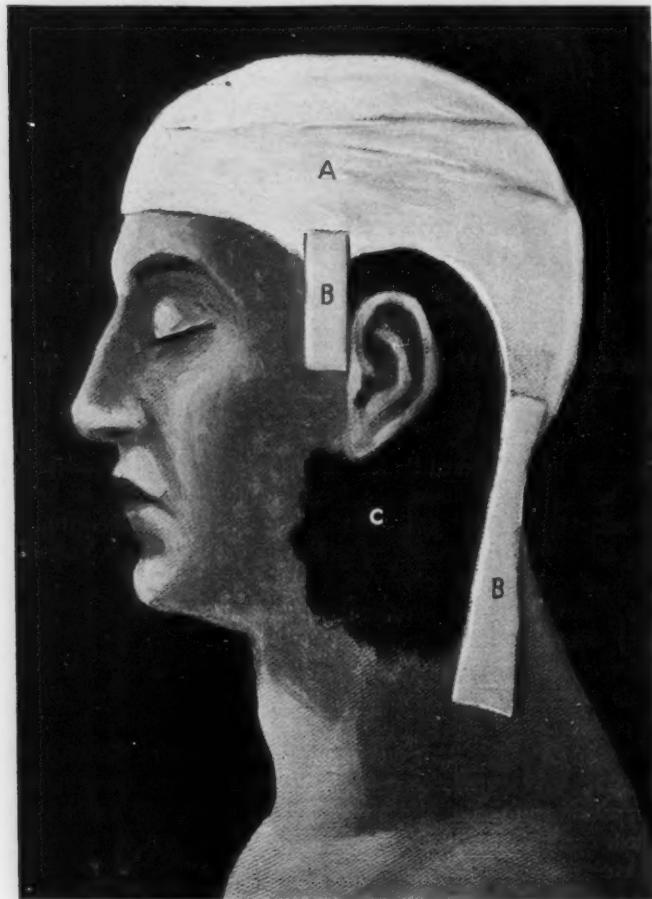


Fig. 1. a. Starch bandage cap, b. Adhesive plaster fixations, c. Tr. of Iodine 10% application over entire exposed region.

PREPARATION OF PATIENT.

After the usual shaving and scrubbing of the field of operation, it is the custom to cover the head with towels, rubber, or cloth caps, etc., all of which are easily displaced during the operation, and

cause the constant annoyance of the hair being too close to the operating region. In order to overcome this difficulty, especially in women, I have been employing a starch bandage, which is applied in a wet condition, usually the day before operation. After the patient is partially anesthetized, as much of the starch bandage is cut away as there was hair shaved off the mastoid region. In front of the auricle and down on the neck a piece of adhesive plaster is



Fig. 2. Beckhause clamps holding the starch bandage.

applied to further insure its retention, as shown in Fig. 1; or I frequently apply the Beckhause clamps, which pinch the skin and bandage at the two or three points and at the same time hold a sterile towel, as shown in Fig. 2. Prior to making the incision I have been employing for over a year the application of tincture of iodine solution over the entire field of operation without first scrubbing and washing with soap and water (Fig. 1), this having been done the day before. The purpose of this application is that it sterilizes the skin, penetrates into its deepest layers, and thus prevents stitch abscess and skin infections.

(a) *Method of Illumination.*—In comparing the value of the various means employed to illuminate the field of operation, one must state the kind of mastoid operation he is doing. In the simple mastoid, he may get along very well by direct daylight illumination, or the ordinary artificial light of the room. The better light is an 8 or 16-candle power lamp, hooded and fixed to a head band such as the Stuckey, J. B. Murphy, Pynchon and others, all based on the same principle. In the semi-radical and radical operations, in fact



Fig. 3. Instrument tables and illumination.

wherever one must be able to illuminate depths and to focus them, reflected light is preferable. Kirstein's mirror of the latest pattern is the best instrument for that purpose; although it becomes very tiresome to operate at great length with this mirror on. The Clar light is not bright enough. A good substitute, in fact probably to be preferred to any other method of illumination for any kind of mastoid operation, is the ordinary head mirror and the fifty-candle power lamp, stereopticon style, as the source of light. This is placed into a swivel socket on a flexible cable bracket by means of a clamp, which may be attached anywhere. The best place is on the corner of the operating table, and usually on the same side on which the operation is being performed.

(b) *Operating Table*.—The head-rest, which is curved in conformity to the head and neck, is so constructed as to be elastic enough to give sufficiently to relieve any concussion while using the hammer and chisels. It is detachable from the table proper and facilitates bandaging the head.

(c) *Instruments*.—There is a usual set of instruments for every kind of mastoid operation, because even if one only intends to do a simple or semi-radical one, one may find pathological conditions so that one should be ready to take much more radical measures. I will say that it is best to have as few of them as possible near by, and the special ones on another table, which the nurse may hand over when needed, the same as she does suture material, solutions and dressings. I believe that as a rule the operator and first assistant should handle their own instruments rather than call for them, since much time is saved thereby. The nurse is to clean and to replace them where they belong each time that they have been used. The arrangement of the instruments is as follows:

Table 1. 2 knives, 12 Ochsner artery forceps, 2 periostetomes, 2 scissors, one straight and one curved; 2 Allport retractors (Jensen's), 1 mallet, 4 gouges, 4 chisels, 3 curettes, 1 Rongeur, 2 blunt-pointed probes, 1 angular dressing forceps, 1 anatomical forceps, 1 rat-tooth forceps, 1 motor with cable and handle, 8 variously shaped drill points, 1 hand burr, 2 plain retractors, 2 fine gouges and chisel for labyrinth operation, 1 Jansen Rongeur, 1 fine osteectomy forceps, 2 Kerrison forceps, 1 Cozolini forceps, 1 small curette with long shank for Eustachian tube, 1 skin graft carrying probe, 1 Siegel's speculum, 1 aneurism needle.

Table 2. 12 needles, 2 needle-holders, 1 Michel's outfit for metal clip sutures, silk worm gut, cat gut, silk, horse hair, Adrenalin, Tincture of Iodine, split rubber tubing, pinwheels, sponges small and large, dressing pads, bandages, pins, adhesive plaster, corset dressing, Beckhouse clamps, towels, etc.

I have simply mentioned those instruments and supplies required at the operation that I use, and not attempting to compare other instruments which I have used, since that would require very much time and would be of very little value. After all, if the instruments are in good order, anyone who has surgical ability can use almost any kind of instrument that is usually employed.

ANESTHESIA.

The most frequently employed anaesthetic, ether, is by far the safest, but to my mind the most irritating and objectionable to the

patient. I wish to say, further, that the only death that I ever saw, most probably due to the anaesthetic, was when ether was employed in a mastoid operation; and on several occasions I have seen quite marked respiratory collapses when ether was given. The general cry against the use of chloroform has prejudiced me against using it very often, so that I cannot say very much about it, but I distinctly remember that formerly when I did use it the anaesthetic appeared much more satisfactory all round.

There are two methods of anaesthesia that I wish to mention in mastoid surgery, that have given me excellent results.

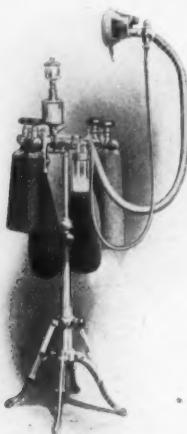


Fig. 4. Teter Gas-Apparatus.

FIRST.—Nitrous Oxide and Oxygen Mixture.—This is administered by means of the Teter apparatus, (Fig. 4) by an expert anaesthetist. In all cases where a general anaesthetic of chloroform or ether is contra-indicated and a local infiltration anaesthesia is impossible, the nitrous oxide oxygen is certainly an admirable anaesthetic. In fact, if one has such an apparatus, and a trustworthy anaesthetist who understands the management of the same, one would do well to give this anaesthetic in every case. I have employed it in a case of sinus thrombosis following scarlet fever, in which the mastoid operation, cleaning out of the clot, ligation of the jugular and resection of the same was done with absolute anaesthesia of the patient. The boy had a nephritis and cap-

illary bronchitis as well as an anaemia that could not stand any other anaesthetic with any degree of safety.

SECOND.—*Local or Infiltration Anaesthesia*.—Schleich, Neumann, Day and others have reported excellent results when employing the same, and I wish to add to my report that it was at first a revelation and always a great satisfaction to have operated under this form of

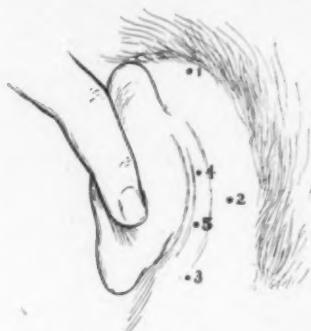


Fig. 5-a.

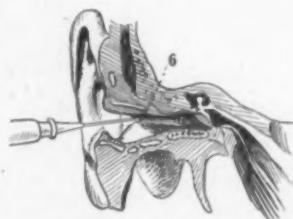


Fig. 5-b.

Fig. 5. a. The five points indicate position of the needle punctures, at the nerve root where the injection is made. b. Cross-section of the canal and the sixth point indicate the puncture with the needle just at the fold between membranous and osseous portion of the canal—this point anesthetized the canal, tympanic membrane and cavity proper.

anesthesia without any pain in the majority of cases. There is one instrument more than any other that enables one to do so much on the bony structure without pain under local anaesthesia, that I desire to mention here, although taking it up in another part of the paper, and that is the electric drill. The hammer and gouge or chisel are



Fig. 6. Precision-Syringe (Record.)

unbearable to a patient under local anaesthesia. In the past four months I have employed the method of infiltration anaesthesia as recommended by Braun. After making the usual Schleich subcuticular infiltration, the further technic consists in injecting a solution of novocain, five parts, adrenalin 1-1000 Sol, three parts in ninety-two parts of normal salt solution, in the very region of the sensory nerve at the ext. audit. canal, middle ear and mastoid region.

as one does in injecting alcohol in the very vicinity of the trigeminal nerve in Tic Doloreux. This is also known as the Block method of anaesthesia. The point selected for the needle punctures are shown in Fig 5, (a and b) and about 10 minims are injected at each point at the proper depth. The best instrument I have found, after employing Neumann's and others, is the "Precision-Syringe Record," as shown in Fig. 6, since it is always in order.

DIAGNOSIS BY AID OF RADIOGRAMS.

Before discussing the technic I hope I may be pardoned for calling attention to a point in diagnosis, since it is of value especially in the technic of the operations as to the probable size of the mastoid process, or rather as to the extent of the cells and the location of the sinus. I refer to the aid of the radiograms.

Fig. 7. Normal Mastoid Right and Left.—This radiogram shows the great rarity of one side being a small diploic mastoid, while the other side is large and is of the pneumatic variety. Out of three hundred radiograms of heads examined by myself of mastoids, this was the only exception to the rule, that both mastoids are of practically the same size and shape. This fact is further supported by Kanasugi's work of dissection and measurements of four thousand skulls for studying the topography of the mastoid process.

Fig. 8. Normal Mastoids Right and Left.—While the soft structures make considerable difference in the shadow or outline, the same structures can be made out very clearly as in the skull. I wish to call attention to the large number of cells and to the considerable size of them. Such mastoids are known as *pneumatic mastoids*. In all such cases the sinus is quite a distance from the external auditory canal.

Fig. 9. Normal Mastoid Right and Left.—One observes the smallness of the process and the conspicuous absence of the cells. This is known as a *diploic mastoid*, and in these cases the sinus is close to the external auditory canal.

Fig. 10. Skull Right and Left.—One will distinctly observe the outline of the mastoid cells showing the middle ear with the denser cochlear structure within, also the denser structure of the petrous portion of the temporal bone. The sigmoid sinus is distinctly seen in its course from the region of the torcular herophili to the external mastoid border, bending downwards and inwards to the jugular bulb. The most important point is the symmetry of both mastoids.

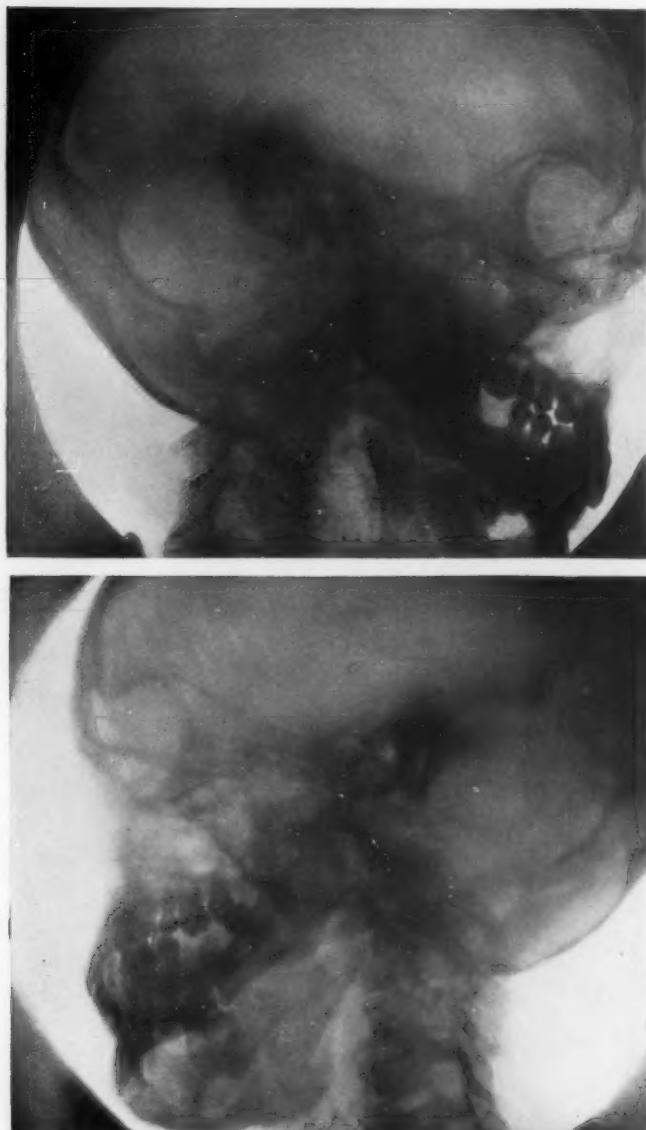
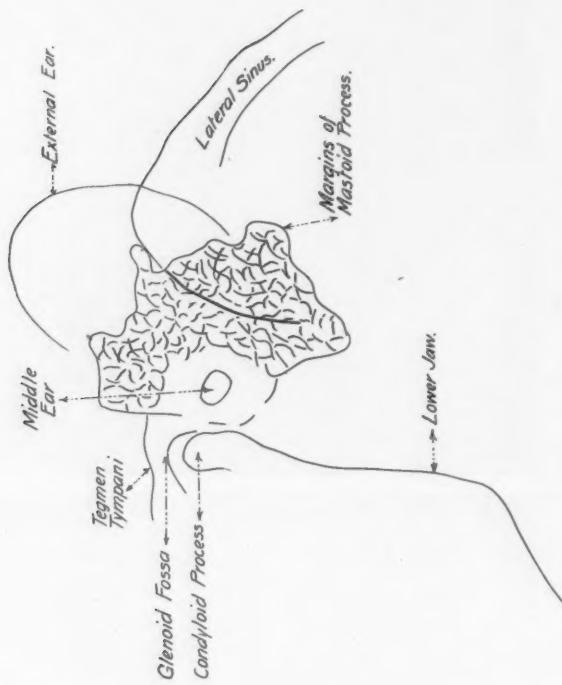


Fig. 7. Normal head—(normal tympanic membranes) right and left side—one side is of the semi-pneumatic type; the other side is of the diploic type. The great exception to the rule (1 in 300) that both mastoids were not of the same variety. The middle ear of the left side is not as clear as the right.

HEAD - NORMAL
Small Celled Pneumatic Mastoid



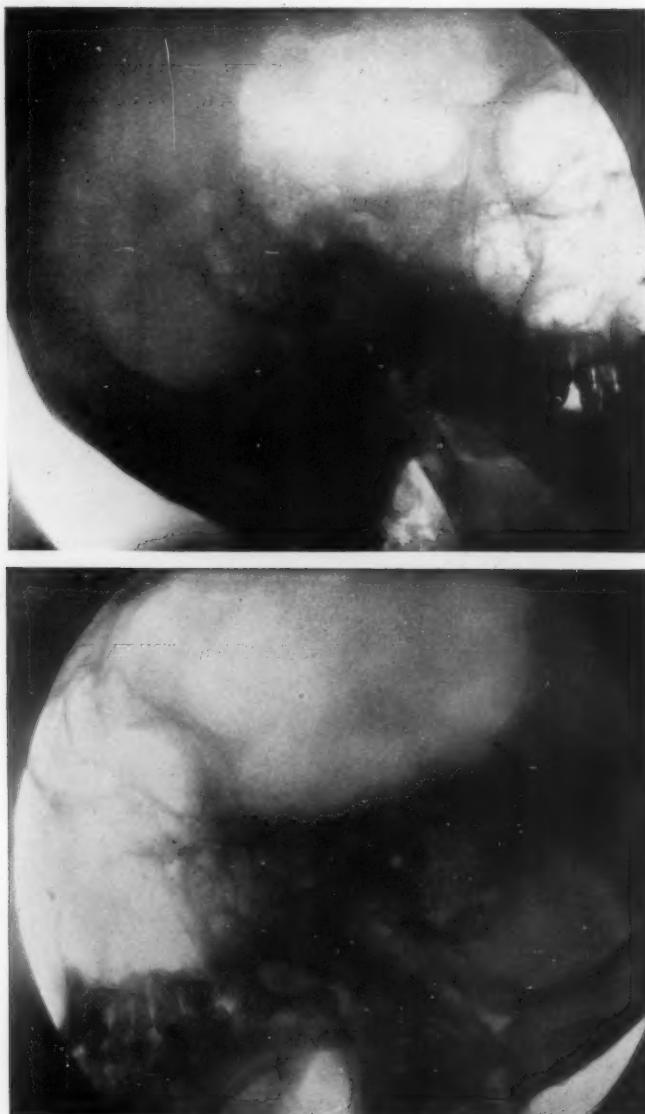


Fig 8. Normal head—right and left side—showing pneumatic variety of the mastoid process. Both sides are practically of same size and form. Both sinuses are clearly outlined, both ears are clear.

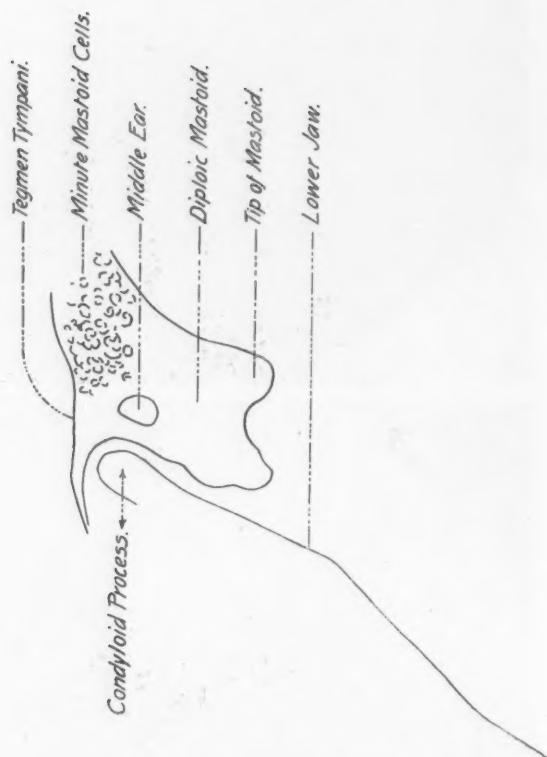
NORMAL DIPLOIC MASTOID.



Fig. 9. Normal head—right and left side—showing diploic variety of mastoid process. Both sides are practically of the same small size; both sinuses are very close to the margin of the posterior canal wall. Both middle ears are clear.

SKULL
Mastoid Position.



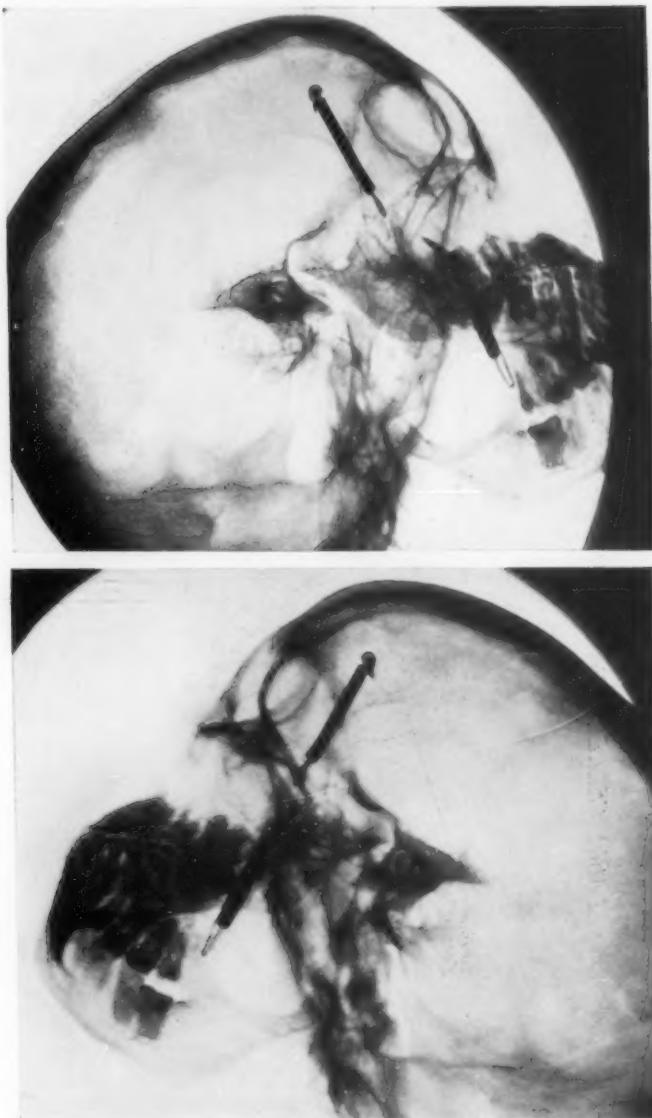


Fig. 10. Normal skulls—right and left side—demonstrating the similarity of the two mastoids as to the cells—sinus, and denser structure of the petrous portion of the temporal bone.

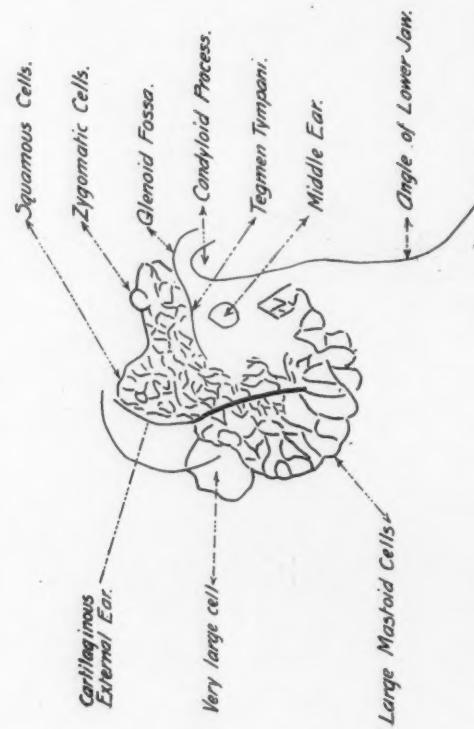
LARGE CELLED PNEUMATIC MASTOID. Acute Mastoiditis Series.



Fig. 11. Normal right and acute involvement of the left mastoid. Showing in the right side a pneumatic variety of mastoid, the partitions of the cells are clearly outlined; the middle ear cavity is clear.

The left side is dull, as is also the middle ear cavity. The whole mastoid process was destroyed and the tip shows a light area which is in the vicinity of the exposed sinus; the latter, however, is clear in its outline, as is the one on the healthy side.



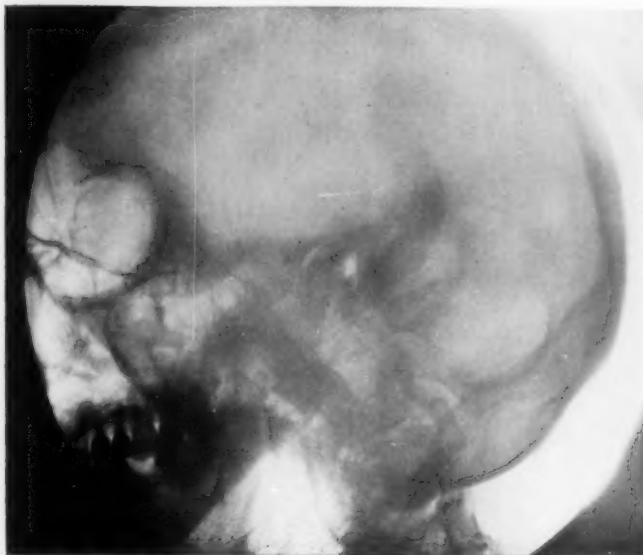


Fig. 12. Post-operative. Six weeks. Wide drainage through incision, showing deficiency in bone formation of the cavity; middle ear is clear.

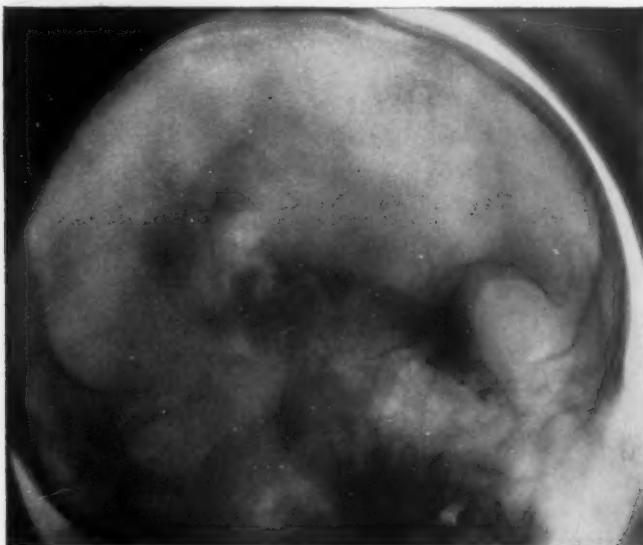


Fig. 13. Post-operative—six weeks. Exenterated by means of electric drill—united incision primarily and drained through separate one. Showing deficiency in bone regeneration of the cavity, also along the posterior canal wall. Middle ear is clear.



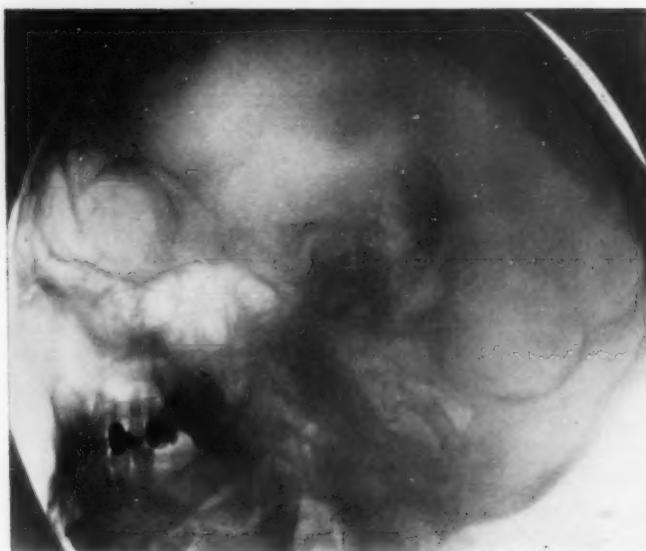


Fig. 14. Post-operative—six weeks. Exenterated cavity by means of a curette draining through separate incision and uniting the primary one. Showing rapid bone regeneration, but slow clearing of cavity of the middle ear.

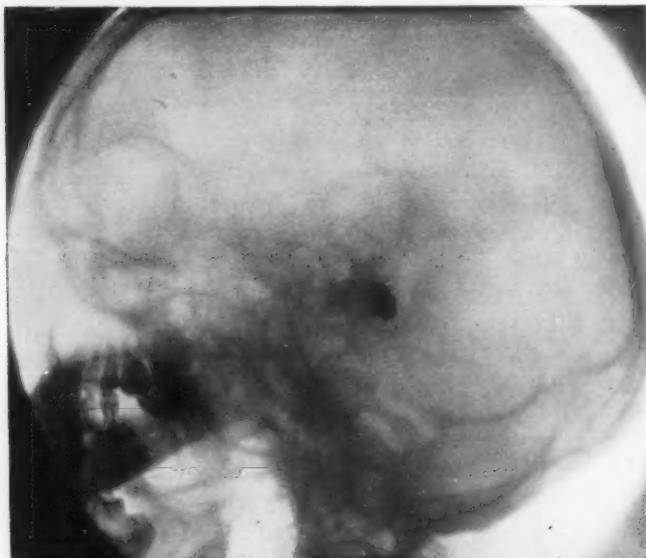


Fig. 15. Post-operative—six weeks. Exenterated by curette and filled with bismuth paste, uniting the incision primarily and draining through separate one. Showing bone regeneration fairly rapid, still some (about 1-3) of Bi. paste in the cavity—a small particle is in the middle ear, the latter is fairly clear.

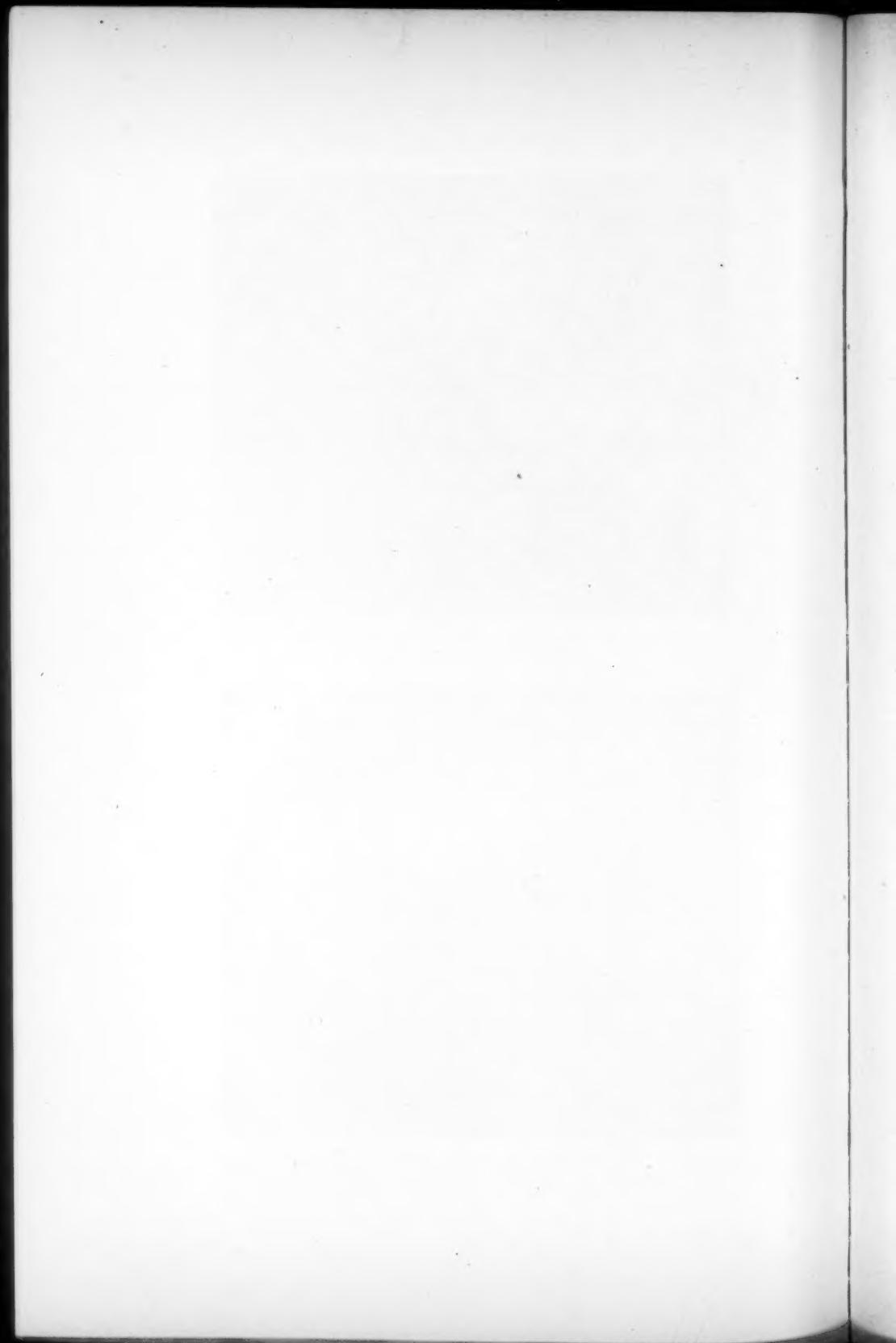


Fig. 11. Normal Right and Acute Involvement of Left Mastoid.
—This case shows a large pneumatic mastoid on the right side, with a distinctly clear middle ear cavity and a clear sinus. On the left side there is no evidence of the partitions of the mastoid cells, the middle ear is blocked and the sinus is clearly outlined. At the operation the mastoid process was markedly destroyed, but the limits were exactly those of the healthy mastoid.

SIMPLE MASTOID OPERATION.

Based upon the information gained by the radiogram, I wish to state that not in one instance have I been misled by it, especially as to the anatomical outline. I believe that in every case of acute mastoiditis that has to be operated upon one should remove every cell thoroughly, no matter how far they extend. The simple decortication or only opening down to the antrum is not good surgery. Not only should the antrum be opened wide, but it should be curetted of its diseased membrane and one should expect its cicatricial obliteration. There are cases without number that have had no other treatment than a Wildes incision or decortinating part of the mastoid process that recovered, some permanently, especially in children. But there is too great a danger from recurrence or perpetual discharge from the retro-auricular fistula and middle ear to even think of such a conservative treatment. My contention, therefore, is to eradicate all the cells up to the aditus ad antrum and not to expect any resolution of these structures. I recall several cases that I treated by the so-called conservative method, especially in children, that had been healed for sometime, which would, following an acute rhinitis, return with a swelling in the retro-auricular region, which had to be opened and cleared of its pus. If this recurrence follows soon after healing has taken place, then the symptoms are very slight and spontaneous rupture follows. If, however, some time has elapsed, then much greater symptoms are manifested.

Last October, at the Austrian Otological Society, this subject came up for discussion, and Neumann, Politzer, Frei, Bondy and Briel all expressed themselves as to the wisdom of the complete eradication, including the antrum, finding that then bone infiltration can follow and prevent recurrences. I desire to state in this connection, that I believe regeneration of bony structure in the exenterated mastoid cavity depends upon (1) the preservation and proper suturing of the periosteum, (2) the use of the curetted rather than the burnishing process by the burr, and possibly (3) the

filling of the cavity with bloodclots, or, better still, bismuth paste. The following radiograms I present to verify my belief. Fig. 12. Wide drainage through incision. Fig. 13. Electric drill and primary closed incision. Fig. 14. Curette and primary closed in-

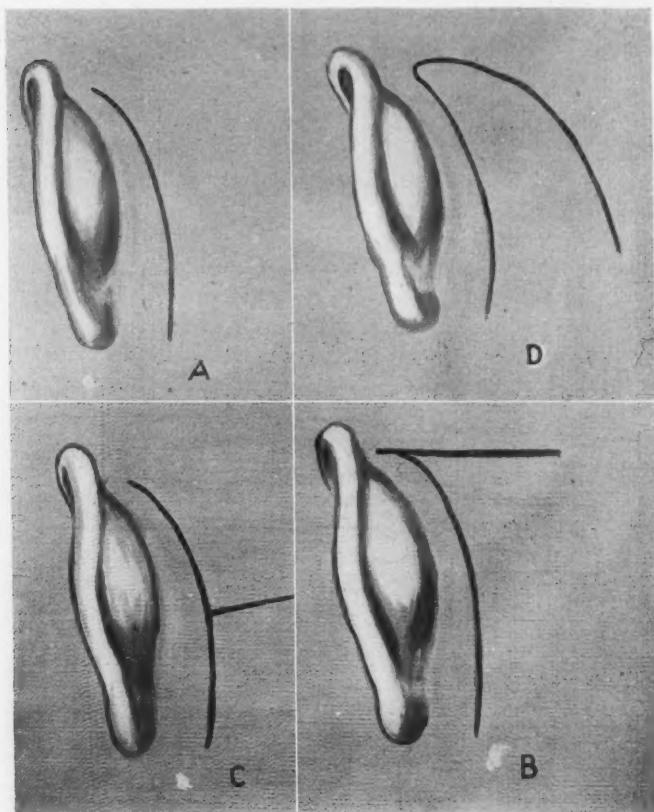


FIG. 16. METHODS OF INCISION. a. Usual. b. Zaufal. c. Whiting. d. Author's.

cision. Fig. 15. Curetted and filled with bismuth paste and primary closed incision.

Fig. 16. Incisions.—The usual incision (a) begins on the level of the upper margin of the auricle, and is carried in a curvilinear direction, a little below the tip of the mastoid process, one-fourth of an inch from the insertion of the auricle. This is efficient in the

majority of the cases. It can easily be extended forwards above and downwards below as pathological conditions may require. Should the pathologic condition, however, be more extensive, as for instance a sinus thrombosis, etc., then an incision allowing greater exposure will become necessary. Of the incisions that I have employed, namely the Zaunfal b, and Whiting c, I will say that the latter gives a greater area of exposure, but two flaps are less desirable than one, on account of the formation of a visible scar, and, therefore, the former is preferable. In order to combine these two good points of the two varieties of flaps I have devised and

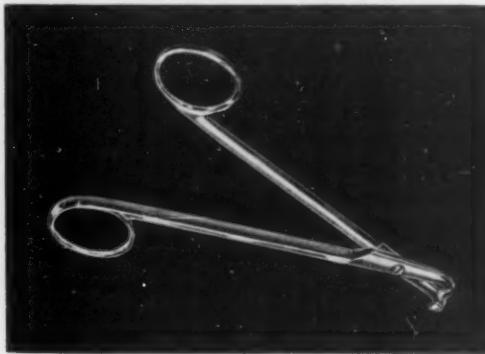


Fig. 17. Blunt's Angiotribe.

employed a tongue-shaped flap, which is made after one finds that the usual incision (a) will not suffice. Continue the incision from before backwards over the occipital region, as illustrated in d. This incision is entirely hidden in the hairy parts after union takes place.

In all these incisions one should be careful to preserve the periosteum while separating it in the operation.

HÆMOSTASIS AND RETRACTION.

Since hæmostatic forceps are in the way and prevent the proper retraction of the tissues, a method to control the bleeding and retract the tissues is very desirable, and we have been fairly successful in doing it by the aid of the Allport retractors. There are times, however, no matter how accurately the retractors are put on, that some oozing will still continue, especially from the skin vessels. In order to stop this annoyance, I have been employing an instrument which I take pleasure in presenting (Fig. 17), known as

an angiotribe, devised by Blunk, and find it to be good. The technic is to grasp the bleeding point with an artery forceps, and then, instead of a ligature, pass the instrument over the tissues and squeeze them. That procedure destroys the intima and closes the vessels. I desire, however, to say that this instrument is not to detract one particle from the value of the Allport retractor, or any of its modifications as a haemostat and retractor. I prefer the Jansen, because it is somewhat more powerful.

DECORTICATION AND EXENTERATION.

In the simple mastoid operation I prefer removing the cortex of the mastoid by the aid of the gouge in preference to burrs or other drilling instruments, except under local anæsthesia. Comparing the various methods employed in the exenteration of the general mastoid cavity, after the cortex has been removed by the various gouges and chisels, one must consider the kind of mastoid bone we have to deal with. In the pneumatic variety, or where there has been a great deal of softening and destruction going on, the use of the curet is very satisfactory.

In the diploic or sclerotic variety, the use of the electric drill is superior to any other method. In the past two years I have employed the electric drill in many cases, and have been very well satisfied with the results. I desire, however, to record an observation that I have made in a number of instances in the healing or regeneration of the exenterated cavity following the use of the drill, and that is this: That the smoother the cavity, the slower was the growth of the granulation and obliteration of it and subsequent radiograms taken of such healed mastoids showed a great deficiency in the bone regeneration, as compared to radiograms wherein the curet was employed, or, in other words, where the cavity was not so smooth. This has already been referred to in another part of the paper. This observation is also important in connection with the meato-mastoid, as well as the radical operation, only in these cases it is beneficial not to have large granulations form and epidermization can take place more easily over a smooth surface. What the cause of the retardation of this process of bone repair is, I have not been able to find out nor is there anything definite on the subject in the literature. It is possible that the great heat generated by the electric drill may be injurious to the bone, or particles of bone dust are driven into the Haversian canals, which are slow to be thrown off and absorbed.

There are cases of acute mastoid exacerbation of a chronic suppuration that have a completely eburnated mastoid tip and in such cases it is very difficult to decide as to the extent of the exenteration to be performed. The reason for that is that all one can hope for in the healing is a reformation of this already present bony structure; therefore, one might hesitate to remove it. Nevertheless experience has taught us that often-times at the most extreme tip of the mastoid there are found cells of considerable size which are infected and cause trouble. It is, therefore, best also in these cases to completely exenterate the entire mastoid and the burr is the best instrument to employ in such cases. As to the matrix of cholesteatoma that should always be thoroughly removed.

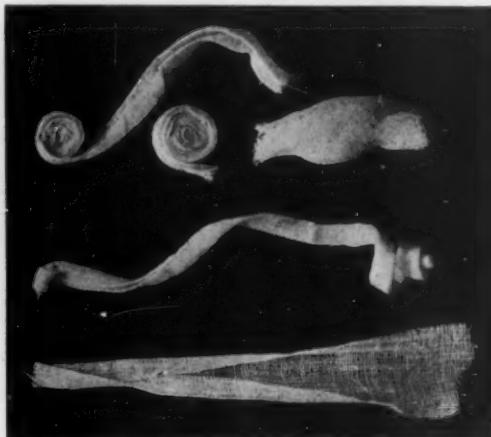


Fig. 18. Gauze Pin-Wheels.

PRIMARY DRESSING OF THE CAVITY.

This will depend of course a great deal on the kind of cavity one has to deal with after exenteration.

1. In case of the sinus, dura, facial nerve, or labyrinth having been exposed by the diseased process or accidentally during the operation, I employ the spiral split rubber tube, leading up to the bottom of the antrum and the remainder of the cavity filled with gauze (pinwheels) Fig. 18. If, however, none of the above mentioned vital structures are exposed then I have employed these various methods.

2. Same as if exposure of the above mentioned structures was present. Fig. 19.
3. Fill the cavity loosely with gauze. Fig. 20.
4. Allow the cavity to fill with bloodclot and employ silk worm gut as drain. Fig. 21.
5. Fill cavity with bismuth paste No. 2. (Bismuth subnitrate, thirty parts; vaseline, sixty parts; white wax, 120 degrees melting points, five parts, and paraffin, five parts) and employ silkworm gut as drain. Fig. 22.

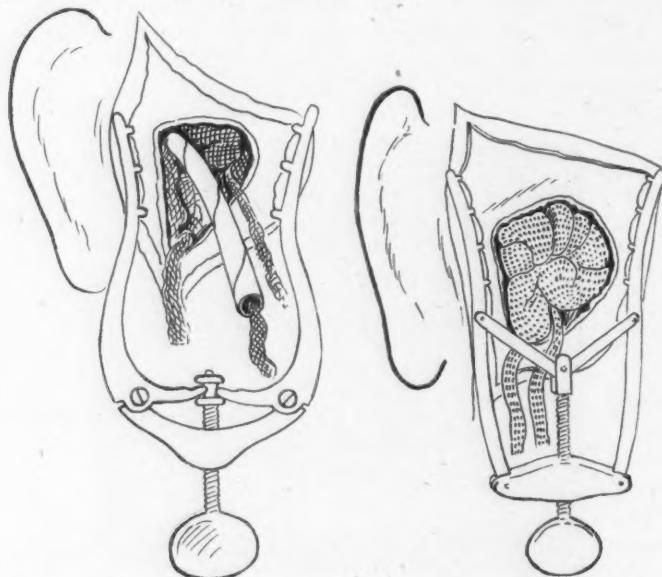


Fig. 19. Split rubber tube and pin-wheel gauze.

Fig. 20. Cavity loosely filled with gauze.

The comparative merit of these different methods will be discussed in conclusion of the suturing of the wound.

METHODS OF DRAINAGE.

We may drain through the incision usually at the lower angle as shown in Fig. 23 and 24. Or uniting the incision in its entirety and drain through a separate small opening externally and below the incision as shown in Figs. 25, 26 and 27. The comparative merit of these two methods, from my personal observation, is that the separate drainage opening, uniting the incision primarily, is much

to be preferred, owing to the fact that a rapid healing takes place, not as liable to stitch abscesses, and a much lesser deformity and scar formation. Of course, if the process is of a very septic nature one will choose a larger and freer drainage and in such cases I usually drain through the lower portion of the incision.

METHOD OF CLOSURE OF INCISION.

1. Deep and superficial silk worm gut sutures placed interruptedly are the most frequently employed. The objection to the deep sutures is that they cut into the skin and cause scars which are

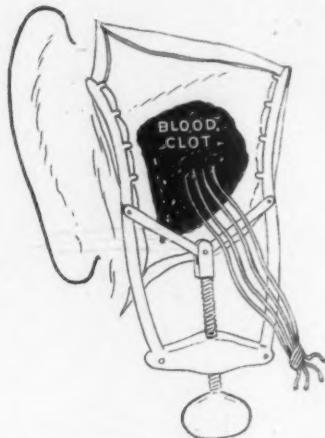


Fig. 21. Blood-clot and silkworm-gut drain.



Fig. 22. Bismuth-paste and silkworm-gut drain.

visible for some time. In order to overcome this difficulty I interpose a small roll of gauze after the skin has been brought together by a few superficial stitches over which the deep sutures are tied as shown in Fig. 24.

2. The Michell metal clasp sutures have been employed considerably in mastoid surgery on account of the ease and rapidity with which one can close the wound by their means, and I believe that for superficial sutures they are very serviceable; however, they will not take in the periosteum especially when there is considerable infiltration about the tissues. Again puncturing the skin as they must, there is a great liability to stitch abscess formation.

3. Deep catgut sutures and superficial silk or horsehair, either continuous or interrupted, I have employed many a time and have found them very satisfactory.

4. In all cases where the primary incision is closed and a separate opening for drainage is established, I employ the following sutures, and will say that it is the simplest and most satisfactory method of suturing that I know of.

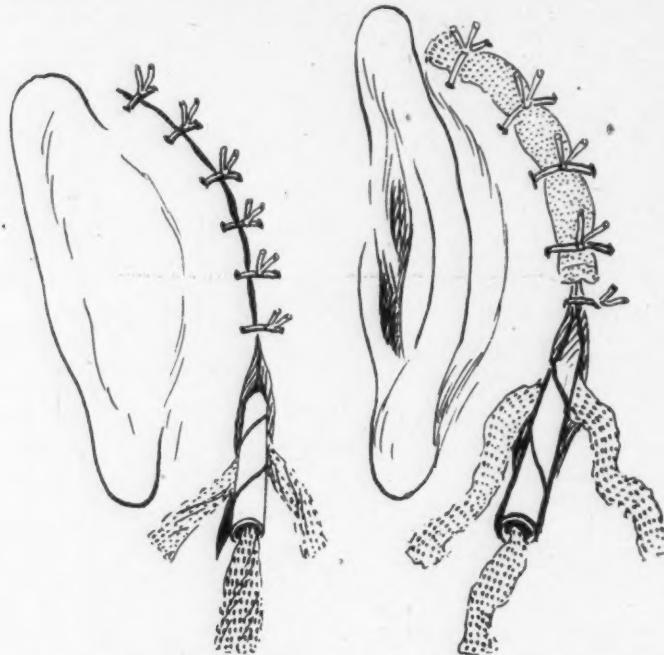


Fig. 23. Drainage through incision.

Fig. 24. Same, but sutured over cigarette drain.

TECHNIC.

The needle is first made to enter the skin at the upper angle of the incision and slightly to one side, it is carried through all the tissues including the periosteum, then taking a firm hold with tissues forceps of the periosteum of the opposite side the needle is passed through it from without inwards. Crossing over to the opposite side again the periosteum is taken in, sutured, and this is repeated back and forth in a continuous manner until one reaches the

lower angle of the incision, when the needle is made to come out through all the tissues including the skin slightly to one side of the incision. When the two free ends of the suture are drawn taut, one will observe that the periosteum is brought together to a close proximity for union. This is important, when, as mentioned



Fig. 25. Tube-and gauze-drain.

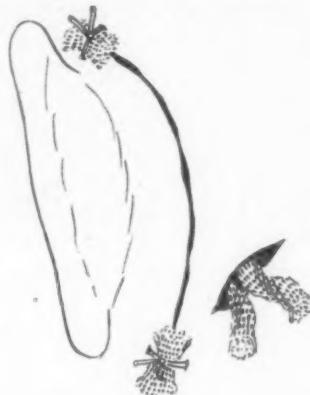


Fig. 26. Gauze-drain only.



Fig. 27. Silkworm-gut drain.

before, future regeneration of bone within the mastoid cavity, or at least its cortex, depends on the preservation of the periosteum. The second part in the technic of this suture is that first recommended by Halsted (Baltimore) in cases of hernia and other abdominal operations and since then used in many other localities. It is known as the continuous subcuticular suture.

The needle is made to enter the skin opposite the periosteal suture in the upper angle of the wound and slightly to one side. Its course is the same as the periosteal suture, except that it only takes hold of the subcuticular connective tissues, emerging again opposite the lower end of the periosteal suture. Fig. 28.



Fig. 28. Periosteal-subcuticular suture. (Halsted-Beck.)

By grasping the upper and lower suture of both the periosteal and subcuticular sutures and drawing them taut, one will observe that all the tissues come in close proximity and the margins of the incision slightly over-lapping. The upper suture ends are now tied over a small roll of gauze while the lower are held firmly by an as-

sistant and then the same is done with the lower suture, Figs. 25, 26 and 27.

The removal of the suture at the end of a week or ten days is very simple; by cutting off both lower ends just below the roll of gauze, both sutures will come out with perfect ease and without any pain by making traction on the upper piece of gauze, leaving an excellent union with the slight possibility of an irritation from the upper and lower suture points. One must test the free mobility of the suture before tying.

In briefly recapitulating the subject of primary dressing, method of drainage and suturing of the wound, I will say that filling the cavity with bloodclot, bismuth paste, strands of silkworm gut, rubber tube and gauze as drainage through a separate opening and uniting the incision by means of the double figure of eight periosteal-subcuticular suture has given me most satisfactory results in obtaining a more rapid permanent healing, cessation of discharge from the middle ear by way of the auditory canal and closure of the perforation, early recovery of hearing and practically no deformity in either the scar formation or bony depressions.

RADICAL MASTOID OPERATION.

In the radical mastoid operation the comparison of the methods of procedure are practically the same as in the simple mastoid operation up to the point of completion of the latter. I desire again to call attention to the value of the radiograph before operation as to the anatomical configuration as well as the pathological processes, that are of value.

REMOVAL OF POSTERIOR CANAL WALL.

The membranous portion is bluntly dissected and torn away at its innermost extremity as the use of any knife such as recommended by Stacke and others is of very little value. The outer two-thirds of the bony canal wall should be removed to its full extent flushed with the floor and roof of the canal and but a slight lip allowed at the lower internal margin where one approaches near the facial nerves. The usual method of procedure is to wait with the formation of the plastic flaps until the close of the operation, but I have been making the flap just as soon as I have removed enough of the posterior wall of the bony canal to enable me to do it. The reason for so doing is that I obtain a much better field for operation at observation of the structure within the canal, besides I do not employ a

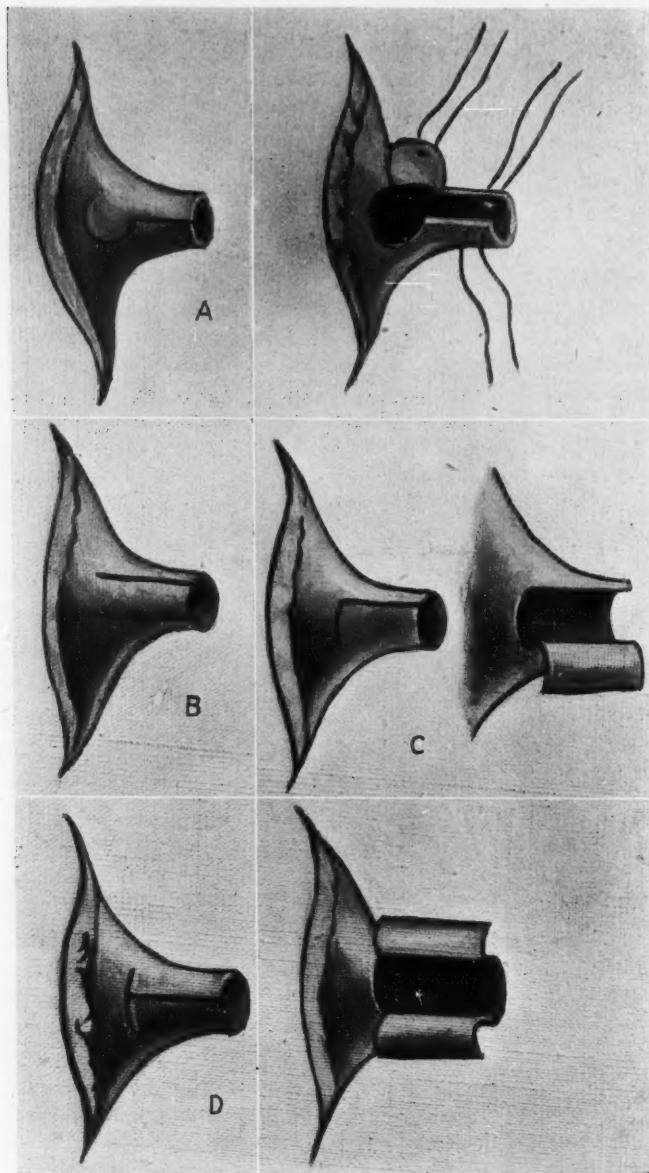


Fig. 29. Plastic flaps. a. Ballance. b. Koerner. c. Stacke. d. Panse.

special retractor, which is only in the way and may injure the tissues. The method advocated by Holmes to employ a strip of gauze tied over the loose membranous canal and drawing it forward is very serviceable but will frequently tear it in an undesirable place. Fig. 29 demonstrates the various flaps that I have employed and all have some special point mentioned in their favor. I believe that this is a matter of personal preference and not of great value. It is just what flaps we are accustomed to making. I have for several

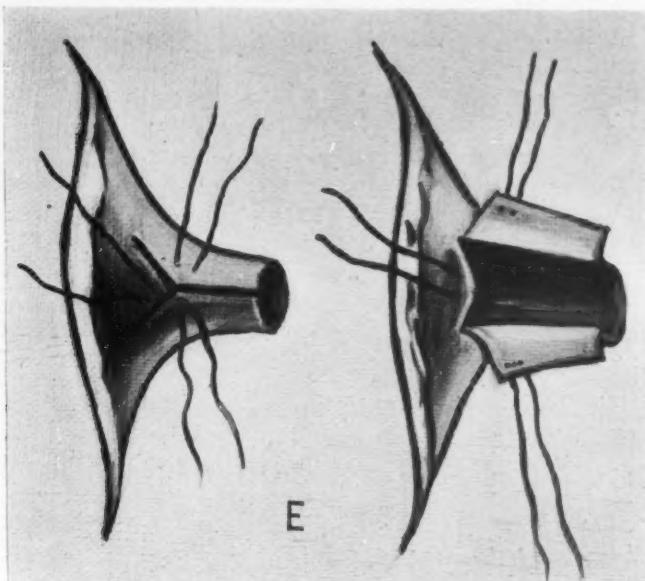


Fig. 30. Siebenmann plastic flap.

years employed the Panse flap with satisfaction, but in the past year I employ the Siebenmann flap as in Fig. 30. The advantage that I see over the other flap is that there are three points for epidermization and the little center flap when drawn back fills up a gap that frequently is the seat of a dead space, where secretions and granulation form some time after the operation. Aside from that, the external meatus is not made unsightly as I have seen from Ballance and other flaps.

As soon as these three flaps are made and superfluous cartilage removed I pass a silk worm suture subdermally through each of

them and jointly pass the threads into the external auditory canal. By drawing on these threads forward one will obtain a perfectly free auditory canal, Fig. 31.

A small tampon saturated with adrenalin is introduced against the perforated drum membrane and into the deepest part of the antrum. *Trimming down the facial ridge.* I prefer the burr to the chisel. It is more safe in any one's hands who is accustomed to using this instrument. In speaking of the bone formation, or the apparent lack of the same in the acute cases where the burr is used, I wish to say it has been my observation the smoother I obtained the cavity in the radical or meato-mastoid operation the better did the flaps

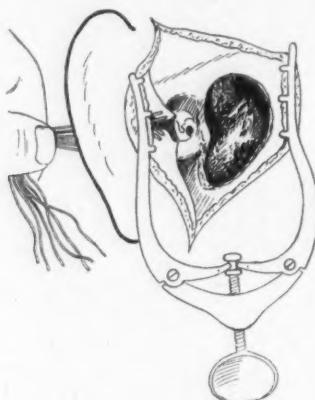


Fig. 31. Traction of plastic flaps anteriorly by suture.

heal in and the faster did epidermization take place. Or if secondary skin grafting was done, they took better. I may say right here that I never do primary skin grafting of the cavity any more, having had no results from this procedure. (The two little tampons are now removed.) The last part of the external wall of the aditus as well as the malleus and incus are next to be removed and I believe in this part of the operation more than in any other do the two methods stand out for comparison. The use of fine chisels should become an obsolete method in the presence of the Kerrison forceps, or some of the modifications of that principle. The simplicity and safety in the use of this instrument is to be highly recommended. I frequently remove the malleus before removing the external wall of the aditus and then after the latter, the incus, with great care not

to disturb the stapes. The thorough removal of the external attic wall or what is known as the epitympanum as well as the floor of the canal or hypotympanum, is of the utmost importance and I have employed the method of its removal as recommended by Allport, that is, by the aid of the burr in preference to the chisel or curette. The further trimming of the facial ridge, especially that part just below the horizontal semi-circular canal I prefer doing with the fine chisels or curettes of J. D. Richards. A tampon saturated with adrenalin solution is inserted into the entire exenterated cavity and allowed to remain a few minutes. Following its removal a thorough inspection is made for any foci of necrosis or fistula, through the tegmen, towards the sinus, facial nerve canal and labyrinth. For this purpose I employ a magnifying lense (Sigel's oto-scope) and if such condition is discovered and it is decided to make further exposure of these various areas, it is done; but since this subject is outside of the province of this paper, it will not be taken up for discussion at this time.

The very important part of the radical mastoid operation, and one from which I believe still very unsatisfactory results are obtained, is the closure of the tympanic end of the Eustachian tube. The method of curettage as far as one can pass towards the isthmus, is the one most frequently practiced.

The use of a small hand-drill, as recommended by Whitehead, is a very excellent method. A method recently advocated by Allport by employing the electric drill I only wish to mention, since I have only made use of it a few times.

The introduction of a slender electric cautery point and burning the mucous surface as well as the application of strong caustics, as chromic acid, are methods not employed very extensively at this time. The retention of the portion of the tympanic membrane to be used as a graft as recommended by Heine has been absolutely valueless in my hands, and one can easily explain the failures since the surface of that structure is lined by epithelium and cannot adhere to a granulating surface. Ballance, Whiting and others have recommended the placing of small skin graft over the mouth of the tube, but I found this procedure not of as much value in obtaining a closure of the tube as the following. What I have been doing with my cases was to curette the tube thoroughly, followed by the use of Whiting's hand-drill, use compression by a small tampon in the tube for a few moments and on its removal place immediately a small skin graft, taken from the patient's arm and applied over

the raw surface like the finger of a glove. This is accomplished by taking a probe, Fig. 32, whose end has four very fine sharp teeth, which are so short as not to penetrate the thickness of the skin graft, but prevent it from slipping off. The graft is placed with the dermal or epithelial side towards the probe, stroked smoothly along the shank of the probe, thus exposing its subdermal structure, which comes in contact with a curetted area. This graft is pushed into the tube about an eighth of an inch and its free margins are smoothed out like a microscopical specimen over the anterior region of the middle ear. Against this is placed a small piece of gutta-percha and this is further fixed by a small gauze tampon. At best but a small portion of cases remain closed, and I believe if one could prevent the physiological action of the tube in swallowing, breathing and other activities of the palatal muscles, thus preventing the air from rushing into the middle ear, most of these tubes would remain

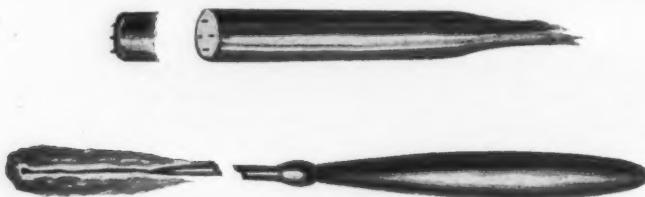


Fig. 32. Special probe for carrying skin graft.

closed after operation. One must also bear in mind the ease with which one can cause minute fracturing of the orifice of the tube or unnecessary traumatism in this locality. Again we know that the little Koerner cells are located around the orifice of the tube which may be infected and not explored. All these conditions may be responsible for the continuation of suppuration from the tube after operation. It is needless to mention that conditions of the nose, the postnasal space and pharynx influence this condition.

We now draw back the three sutures that hold the flaps and replace them in their respective positions above and below and in the center, externally to the incision, but not tied until the incision is closed. The use of catgut to suture the flaps subcutaneously I have discontinued, owing to my having another substance subject to infection and hidden. The simple placing back of the flaps without suture, especially the upper, and only packing gauze against it, is also not satisfactory, because they become easily displaced. The

incision is now closed in the double figure eight form (as shown before in Fig. 28) and tied, following which the three flap sutures are tied over gauze rolls (as shown in Fig. 33).

The primary dressing of passing a split rubber tube as far inward as possible and allowing the remainder of the cavity to be filled with blood is the method I have most frequently applied and with excellent results. It is to be preferred to the method of packing the cavity with gauze, even if it be saturated with vaseline. Recently a number of authors have advocated the simple blood-clot dressing, without any drainage whatever, and from what I have been able to observe in three cases in which I have employed this method, I believe it will become popular.

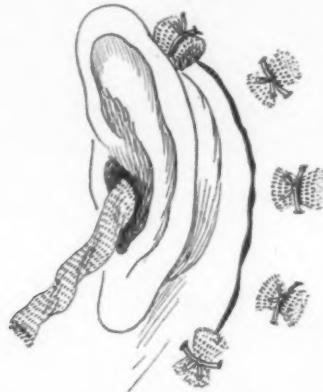


Fig. 33. Operation completed, sutures fixed over gauze-rolls.

While experimenting with the bismuth paste last winter, I employed it as a primary dressing in radical mastoid and have found it an excellent and simple method. However, an experience which I had in one case, the assistant not holding the tissues firmly over the mastoid and thus permitting the paste to infiltrate the loose tissues, caused me to give it up and not employ the paste until a few days later when thorough adhesions have taken the place of the severed tissues.

MEATO-MASTOID OPERATIONS.

In comparing the various semi-radical mastoid operations I desire to mention the procedure as suggested by Stacke, which consists in taking away the upper posterior wall of the auditory canal

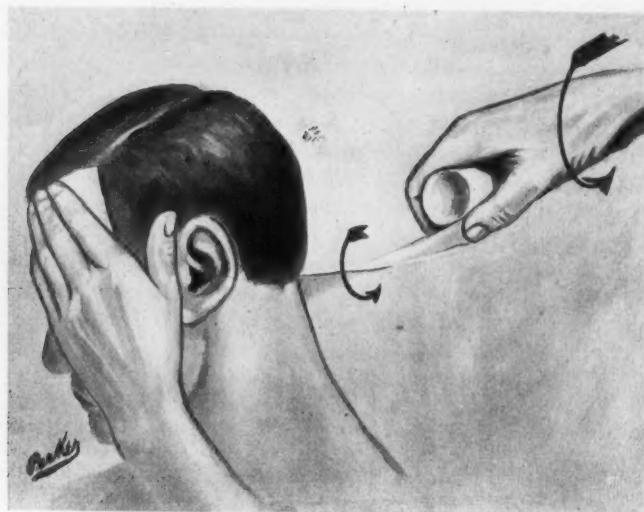


Fig. 34. a. Mastoid continuous reverse bandage. The roll never leaves the right (or left) palm of the hand.



Fig. 34-b.

Fig. 34-c.

Fig. 34. b. Illustrates the mastoid region covered and the two fixed points—suboccipital and preperietal. c. The opposite ear entirely free.

at the margin of the anulus tympanicus and working outward and backward until the antrum is reached. The parts are curetted and a Stacke's plastic flap made of the membranous canal. The ossicles may or may not be removed. About ten years ago I performed this operation with improvement of the suppurative process, but had to do radicals in the cases subsequently to obtain the best results.

At the last meeting of the Ohio State Medical Society, Dr. Iglauer presented a method of entering the antrum of the mastoid by way of the external auditory canal and working forward and upward toward the attic, and eventually backward into the mastoid process. This procedure is done by the aid of an electric burr and is shown to be very easy of execution. (See *THE LARYNGOSCOPE*, Jan., 1910). It is particularly adaptable in the diploic variety of mastoid process, and in children, where the sinus is located close to the auricle. While my conclusions at this time as to the value of this procedure cannot be considered of much importance, as I have employed it in only five cases, I wish to say, that in the cases where the radiogram shows a diploic mastoid to be present I shall attempt this procedure. My results in the five cases referred to have been very satisfactory in each one, although in three of them I performed the radical mastoid, having found pathological changes in aditus and close to the annulus which did not warrant anything less formidable.

The interest manifest in the recent writings concerning the so-called Heath or Meato-mastoid operation have prompted me to perform the same and my results at this time are not very encouraging. It might be held against me from the manner in which I have previously expressed myself in discussing this subject as I was very enthusiastic about it at first. This was due to the fact that in the first two cases the results were startling and have remained so, but in the other twenty-six cases I have been disappointed. Eight are still under treatment, having suppuration from the attic, and seven have been re-operated and have healed except some tubal leakage. The remainder of this series have disappeared from observation. Almost every case was much improved after operation but not for a very long time. The two cases which healed and remained so were children, seven and ten years old, in whom complete cessation of suppuration occurred, with complete healing of the tympanic membrane, and almost normal hearing. These were cases which had been suppurating for several years, both following scarlet fever. The perforations were central and of fair size. From the statement

of the foregoing facts one may conclude that I would not perform or advise the operation. This, however, is not the case. I shall continue to do it in selected cases which will be principally in the young where central perforations exist, which have resisted all local measures of treatment, particularly if the hearing is fair and where both ears are affected. A clear statement to the patient that perhaps a second operation will have to be performed in order to secure a dry ear is imperative. One can only state that this second operation is a much simpler and shorter procedure, although I would not advise, as some have done, to do the second operation under local anesthesia, unless it is specially indicated.

The technic is too well known to repeat it and the procedures which I have mentioned in the radical up-to-the point of removal of annulus tympanicus, and the ossiculectomy, are the same. Also plastic and closure of the wound, as well as the dressing. The complicated and detailed manipulations of the adhesions of the ossicles and perforation, as recommended by Heath, I have never practiced, as I believe that undue manipulation of these delicate structures would possibly defeat the purpose of obtaining normal or good hearing. It must also be mentioned that this operation had been done for some time by Jansen and others, but Heath has developed considerable interest in the minds of the otologists more recently.

As to the other methods of semi-radical procedure one must mention the removal of all the structures as in the radical except the ossicles and not destroying the membranous auditory canal. This thus created cavity is drained retro-auricularly until healing takes place by granulation.

DRESSING.

A good firm mastoid bandage is something that the average assistant or interne does not know how to put on. The majority of them are off before the patient has come out of the anesthetic. Most of the time the bandage is carried about the neck and under the chin, which is absolutely unnecessary and very disagreeable to the patient. Figure 34 illustrates the bandage which I employ and call it the one-hand twist bandage, which means that the entire bandage is applied without changing it from one hand to the other, and is constantly reversed. The fixation points are the forehead and below the occipital protuberance. For the past six months I have been employing a dressing which was first used

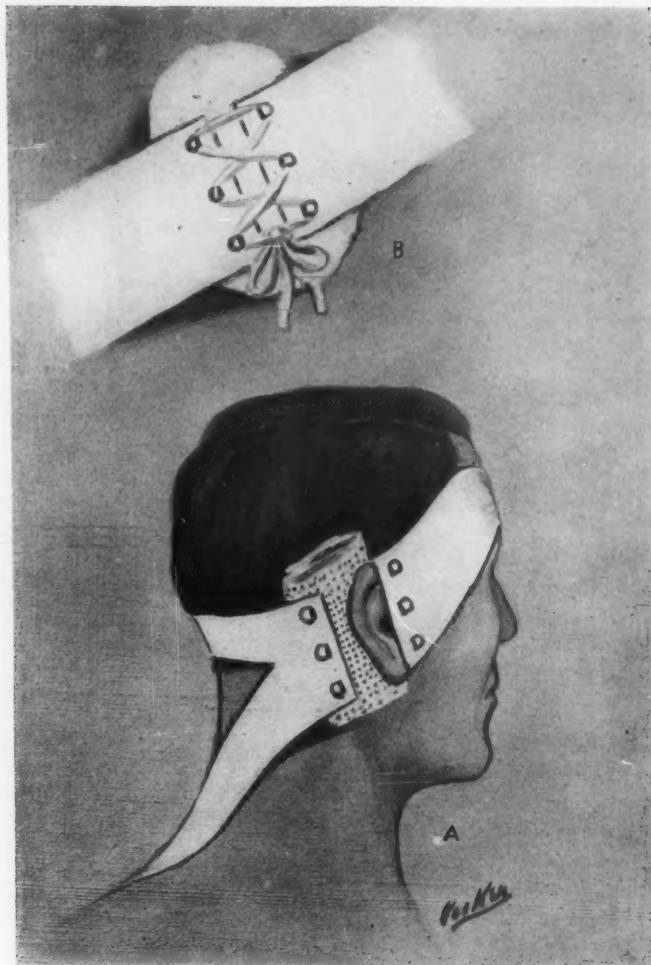


Fig. 35. a. Corset dressing bandage. The first applied over forehead, the second over the shoulder and below the occiput to the retro-auricular portion of the opposite ear. b. The dressing is laced over a pad.

by my brother, Dr. Carl Beck, and described by Dr. Carl F. Weinberger, as applied in laparotomies, etc. It is known as the corset dressing (Fig. 35 shows it applied). It is made of adhesive plaster, with a row of ordinary shoe hooks inserted near the edge, so that two strips placed opposite each other can be laced over a dressing or pad. One end is applied over the forehead and the other is split, one applied over the neck and the other the back. The advantage of such a bandage is that it is light, the dressings are easily changed and the patient does not need to be very much manipulated. Benzine is used for its removal.

In conclusion I wish to say that the after-treatment which is of the greatest importance, especially in the semi-radical and radical methods, has also many varieties, and a comparison of them would be of considerable interest.

2551 North Clark Street.

Treatment of Fracture of the Nose and Deviation of Nasal Septum. C. and F. MARTIN, *Lyon Chir.*, January, 1910.

Martin gives an illustrated description of devices which he states have proved useful in correction of deformities of the nose and especially to aid in healing of fractures of the nose. A little frame fits into each nostril, with an adjustable arm that can be raised and held immovable by means of a screw in the lower part, turned by a watch-key. The two parts are connected by a gold wire which is all that shows as it crosses the septum in front. In some cases more support is needed, and for this he uses a little frame fitting on the face just around the nose with a little hook in front to hold the gold wire. This frame is held in place by a spring passing over the head. He gives illustrations of the results in a number of cases to demonstrate the advantages of his technic, which, he asserts, scarcely discommodes the patient. The principle includes operative correction, chiseling off bone if necessary to restore the normal shape and then immobilization, continued until complete consolidation, by means of a small apparatus placed in the cavity of the nasal fossæ. The pressure induced by the adjustable arm is graduated to secure the maximum of effect without discomfort; the screw is adjusted from day to day as needed.—*Jour. A. M. A.*

A NOTE ON AURAL MANIFESTATIONS OF MYXEDEMA.*

BY S. MAC CUEN SMITH, M. D., PHILADELPHIA.

My object in presenting this particular paper is not to offer anything especially new, but to again direct attention to the interdependence of all branches of medicine and surgery. In other words, those of us who confine our work to certain branches of the healing art are frequently aided, especially in our diagnosis, by the general physician, while on the other hand, the practitioner of general medicine is often the recipient of valuable help from the specialist in the recognition of systemic disease. To illustrate, in the first case of the series of three that have come to my notice, although the symptoms of myxedema were fairly pronounced, neither the attending physician (who advised the consultation because of a progressive defect in speech and hearing) nor I recognized definitely the underlying systemic disease, which, however, was pointed out to us by an experienced internist.

Another case was brought to my notice on account of marked and progressive deafness, with distressing tinnitus aurium, while the third case came more especially on account of frequent nasal and oral hemorrhage, as well as progressive deafness. The symptoms of myxedema in both these latter cases were not very pronounced, but my experience with the first case led me to inquire very carefully into the history, which resulted in a suspicion that myxedema was the underlying etiologic factor. A further examination revealed absence of the thyroid, which confirmed the diagnosis.

In these two cases I was able to assist the attending physician in arriving at a proper diagnosis, and the application of the specific therapeutics of this disease resulted in a permanent alleviation not only of the characteristic myxedematous symptoms, but also of the secondary symptoms involving the ear, nose and throat.

Aural manifestations complicating Bright's disease are now frequently recognized, and may occur so early that they are only secondary to the ophthalmic picture in diagnostic value. The hemorrhagic infiltration into the tympanic mucosa, the failure to recognize high tones, the vertigo arising from degeneration of

*Read before the Eastern Section of the American Laryngological, Rhinological and Otological Society, Watertown, N. Y., January 10, 1910.

the labyrinthine nerve filaments, together with the progressive tinnitus and deafness, due, probably, to edema of the sheath of the auditory nerve, produce a picture or train of symptoms almost as characteristic as those seen in albuminuric retinitis, which, for want of a better name, may be termed nephritic otitis. Although I am not prepared to point out aural symptoms complicating myxedema as characteristic as those occurring during an attack of Bright's disease, or even rheumatism or diabetis; at the same time the cases above mentioned will serve as an illustration of the importance of our giving constant and proper recognition to the fact that many of the ailments that we are called upon to treat are only local manifestations of a systemic disease.

Myxedema, like other conditions resulting from faulty metabolism, is often most insidious in its development, taking many months, or in some cases even years, to produce a pronounced pathologic state or evoke symptoms that might lead to a proper diagnosis. This slow, destructive metamorphosis, which apparently does not yield to any line of treatment, has, no doubt, caused many physicians to prescribe thyroid extract in a purely experimental way, with surprise at the improvement resulting therefrom, especially in cases of impaired hearing, and in all probability this intelligent empiricism has been responsible for the so-called "thyroid treatment of deafness."

We are indebted, therefore, to the united labors of pathologists, physiologists and clinicians for the discovery of one of the greatest, most positive and definite therapeutic remedies that has been applied to the relief of suffering mankind, for where in all the range of physical infirmity is the picture more pathetic than that manifested in the physical and intellectual degeneration incident to myxedema?

The second case, that of a woman about fifty-two years of age, consulted me with her attending physician, complaining of progressive failure of hearing, severe tinnitus and much difficulty in swallowing. Her face, hands, arms, feet and legs were moderately swollen, the skin being dry and desquamating. She suffered from declining mentality, headaches, and marked nervous irritability. Her tongue was considerably thickened. The entire auricle was swollen, being especially marked at the concha. Her voice was rough and rasping.

An examination of the membrana tympani revealed little or no change from the normal. There was, however, a distinct hyperemia of the tympanic cavity, which could be plainly seen through

the translucent drumhead. Indeed, the exudate confined in the tympanic cavity reminded one of a case of hydrops ex vacuo.

The third case, a woman about fifty-six years of age, consulted me on account of a sudden complete deafness of the left ear, which, however, was secondary to a progressive loss of hearing, bilateral, extending over several months. During the first few weeks she had several attacks of bleeding from the nose and mouth. The tongue was thickened and protruded slightly. The tinnitus aurium, which had been progressive, was most annoying. The pharynx, uvula, soft palate and larynx were edematous, the latter, no doubt, accounting for the rough, deep sounds of the voice. The condition of the extremities and skin was similar to that in the preceding case, both patients presenting evidence of well-advanced anemia. The nervous phenomena were likewise similar to those of the other case. In this patient the membrana tympani of each ear was decidedly red and edematous, so much so, indeed, that I deemed it advisable to incise the same, which resulted in the evacuation of some serosanguinous fluid. It is needless to say that both of these cases promptly improved on the administration of thyroid extract, and have since remained entirely free from all symptoms incident to the myxedema. It has been necessary, however, for them to continue taking the thyroid.

The deafness and tinnitus aurium may be due to myxedematous thickening of the tympanic mucosa, or to the formation of myxedematous tissue at the base of the brain, where the eighth nerve is given off. In any event, the symptoms, both general and local, disappear as if by magic on the administration of thyroid extract.

Dr. Robert Pitfield, in the *American Journal of the Medical Sciences*, July, 1909, contributes an interesting history of two cases of myxedema, both of whom suffered from aural manifestations to a greater or less extent. One had deafening tinnitus and "all but total deafness." The other case, sixty-two years of age, married, was so deaf that the doctor had to shout in her ear, "but her mentality was dull and slow, and she suffered extremely from cold."

Dr. Pitfield says of one case that "she had a dull brain as well as dull hearing; indeed, her memory was so poor and perceptions so slow that her daughter told me that she had to serve as brain and ears for her mother, and it quite wore her out to have to talk to her. Not only was her hearing bad, but she suffered from tinnitus to such an extent that she often summoned her family to answer the telephone, when in reality no bell rang; she often heard

pistol shots in her ears; she had hallucinations of sight, and frequently thought she saw people in her room when none were present.

"Dr. Wendell Reber examined her eyes, and he felt her poor hearing was due to poor air conduction and probably to some labyrinthine involvement. Myxedematous infiltration of the pharynx and Eustachian tube was probably the cause. Under two grains of thyroid extract three times a day her hearing was restored to the extent that she could take part in all conversation in her room in ordinary tones; her voice lost its raucous tone, and the scanning speech disappeared."

To summarize, the points of interest are that the patients suffered absolutely no pain in so far as their ears were concerned, notwithstanding that a serosanguinous fluid was evacuated in one case.

The sudden deafness in one case was probably due to the serosanguinous fluid in the tympanic cavity. Improvement in the hearing, however, was not shown until the administration of thyroid extract. The underlying cause of deafness, therefore, in each case, was probably a myxedematous thickening of the tympanic mucosa, or the formation of a myxedematous exudate at the base of the brain, or a mixed lesion in which both of these conditions were present.

1429 Spruce Street.

Influence of Cauterization of Nose upon Cardiac Neuroses.

KOBLANCK, *Deutsche Med. Wochenschr.*, Feb. 24, 1910.

Koblanck gives the description of a case written by the patient himself, a physician, aged 31, who had suffered for years with a cardiac neurosis with attacks simulating angina pectoris. Removal of some polyps in the nose and electrolytic correction of an abnormal protruding part of the septum were followed by complete subsidence of all the trouble. The young physician had become convinced by his symptoms that a large part of them were due to participation of the sympathetic system. The benefit from direct treatment of the sympathetic fibers in the nose confirms this.—*Jour. A. M. A.*

THE CYTOLOGY OF CHRONIC MIDDLE-EAR DISCHARGES.*

BY E. HAMILTON WHITE, M. D., AND OSKAR KLOTZ, M. D., MONTREAL.

The importance clinically of a chronic discharge from the middle ear has long been recognized. The fatality of the intracranial complications, septic meningitis, extradural abscess, brain abscess, or sinus thrombosis, which may originate in such a condition, must impress all with the desirability of preventive treatment. Usually by the time indications of intracranial involvement are present the chances of saving the patient are slight, although modern surgery has done wonders towards improving the outlook even at this late stage.

On the other hand it is well recognized that the large majority of such cases go through life from the cradle to the grave without much inconvenience apart from impaired hearing and what little attention is required by the discharge.

The present investigations were undertaken to see if by an examination of the cytological features of these discharges we could find any constant characteristics by which such cases could be segregated into groups, which would help in making a prognosis as to the probable course of the disease, or would give any reliable guide for the management of the case, especially as to when radical operative interference should be advised.

The origin of most cases of chronic suppurative otitis is apt to be obscure. The ear is usually allowed to run for two or three years before an otologist is consulted. A great many cases start in early childhood, so that the origin is unnoted or forgotten. From what we know of the pathology of the condition it would seem that the stamp of chronicity is usually received at the original onset of the trouble. By this we mean that the destructive processes have gone so far that a complete repair even approaching the nor-

*From the Pathological Department, Royal Victoria Hospital, Montreal.

AUTHOR'S NOTE: The claim has been made by Dr. Milligan,¹ in an address before the Otological section of the British Medical Association that by determining the cytology of middle ear discharges he could differentiate various types of otitis and fix indications for radical operative interference. A criticism of his paper by one of us, (O. K.),² called forth a reply from Dr. Milligan³ defending his views as originally expressed. It was of interest to find in this reply that his claim to have found giant cells in the "exudate" of cases of tuberculous otitis was based on the examination of material collected by a curette, in other words tissue definitely not in the exudate. As we are unable to agree with Dr. Milligan either on pathological or clinical grounds we submit the following results of examined cases where careful percentage counts of the cells present were made.

mal cannot occur. A cure in the sense of a "restitutio ad integrum" is out of the question, quiescence with absence of active symptoms is the best that can be attained.

From a clinical standpoint cases may be divided into groups according to the degree of local destruction and probable cause of the chronicity of the discharge.

In a large group of cases the determining factor of chronicity appears to be a permanent perforation of the drum-membrane, which allows secretion from the Eustachian tube to flow into the middle ear. This sets up more or less irritation or inflammation of the middle ear itself, which may be: (1) limited to the region of the tube, (the hypotympanum), these cases we have classified as due to chronic Eustachian tube catarrh; or (2), it may involve all the middle-ear spaces, these are classified as due to chronic Eustachian tube catarrh, with chronic inflammatory changes in the middle ear itself.

In such cases the degree of disease in the Eustachian tube and nasopharynx is of course a factor of the highest importance in determining the amount of discharge, and to some extent the degree of secondary change in the middle ear.

In the third group the chronicity is determined by the severity of the destructive process in the middle ear, and the character and degree of the reparative process and is more or less independent of the presence or degree of disease in the Eustachian tube and nasopharynx, although such disease may be a very important contributory cause of the chronicity. The most important cases in this group are those complicated by the development of cholesteatoma. Where such a classification can be made it is a most important step in determining the course of treatment best calculated to arrest the process and to bring the ear to a condition of quiescence. There are always, two objects to be attained in the treatment of a case of chronic middle-ear suppuration: (1), to insure the safety of the patient against any possible danger of intracranial involvements, (this is, of course, imperative, and before it all other considerations must fade into insignificance), and (2), to arrest the discharge, if possible; this is of more or less relative importance.

Cases included in the first group are to be regarded as offering practically no danger of intracranial involvement, and may, therefore, be indefinitely safely treated by the most conservative methods. Cases of the other two groups offer such a wide range of differences

that the course of treatment must always be determined from the features of the individual case, and, although on general lines the indications of danger are well recognized, it must always be a matter for the judgment and experience of the surgeon in charge. The social condition of the patient is often of importance in deciding what form of treatment to advise. If the means and opportunity for competent conservative treatment are available radical operation may often be avoided or indefinitely postponed, whereas if without opportunity to get competent attention it is safer for such a patient to have a radical operation.

The mucosa of the middle-ear spaces, except in the region of the Eustachian tube, consists of a single layer of flattened epithelium lying on a small amount of connective tissue, which separates it from the bone and carries the blood supply, it is really a mucoperiosteum. The epithelium is of mucosal origin and not at all similar to the squamous epithelium of the skin surfaces. The epithelium of the Eustachian tube and its immediate neighborhood is of the ciliated columnar type, and in the transition from this to the flattened epithelium of the middle ear there are found ciliated cells of the cubical and flattened type. In the new-born the amount of submucosal connective tissue is quite considerable, but this is normally resorbed as the individual develops so that in adult life it is very slight. This is incidentally an important factor in determining the course and results of middle-ear inflammation in infancy. It is generally held that there are no mucous glands in the mucosa of the middle ear,⁴ though Politzer⁵ states that he has observed them occasionally in the region of the Eustachian tube. In the tube itself they occur abundantly.

The inflammatory changes in the mucosa of the middle ear consist in mild cases of swelling of the submucous layer with engorgement of the blood vessels and more or less desquamation of the epithelium. If the inflammation subsides promptly the areas denuded by desquamation are recovered by regeneration of the mucosa and a return to a normal histological picture occurs. Where the inflammation is prolonged, proliferation of the submucosa occurs and a polypoidal condition is produced. In such a change in the mucosa we can find both a direct and indirect cause for chronicity of the ear inflammation. In the first place such a mucous membrane can rarely return to a healthy state, and, secondly, the thickening, especially if it occur in the region of the *auditus* involving the folds about the ossicles, tends to cause more or less retention of the exu-

date, or discharge, and thus to delay or prevent healing. Where the inflammatory process is more severe, extensive denudation and ulceration occur, which may involve the underlying bone. Repair of this extensive denudation is often accomplished by inward growth of the epidermis from the external auditory meatus. It may sometimes occur from the remains of the mucosa, but in such a case the cells of the mucosa tend to show a metaplasia to the epidermal type. It is the epidermisation of the middle-ear spaces which forms the basis of the cholesteatomatous condition frequently met with in middle-ear suppuration. It is now recognized that the destructive characters of cholesteatoma arise purely from the retention of inflammatory productions and that the pearly masses sometimes found are only the products of desquamation of the epidermis which has invaded the middle-ear spaces.

From this brief outline it will be seen that the pathological conditions in a case of chronic suppurative otitis media are apt to be extremely complicated. From the presence of secondary infection, which is, we may assume, constantly present there is to be expected a more or less active reaction to infection, while in certain regions the disease has reached a stage of extreme chronicity or is healed.

From our knowledge of the histology we know that mucus in any considerable amount must come from the Eustachian tube, whatever other portion of the middle ear is involved. Where the middle ear is inflamed without tube involvement, as in cases of attic disease, the discharge is always of purulent or seropurulent nature with scanty mucus.

The technique of collecting the smears was as follows: The ear was thoroughly cleansed by syringing and careful swabbing. Where there was evidence of disease in the region of the attic or antrum the cleansing was extended to these regions by an intratympanic irrigation by means of a Hartman's cannula. The ear was then left without treatment for twenty-four hours, being protected by a piece of sterile wool in the meatus. Where discharge was abundant the excess was swabbed out of the meatus before collecting the smear, but in several cases very little discharge was present, and, therefore, it had to be collected directly by introducing a fine swab through the perforation. All possible care was taken to reduce possible contamination from the meatus to a minimum.

Several smears were carefully made from each case and were dried and fixed. Several staining methods were usually employed.

In most instances one specimen was stained with carbolthionin and another with Wright's stain. Occasionally, too, specimens were stained with weak fuchsin, eosin or Gram.

The specimens were examined at the laboratory without having any information as to the nature of the condition in the ear. Cell counts were made from each. In many instances there was some difficulty in counting the cells, as many of the leucocytes and other cells had undergone degeneration, so that their nature could not be determined definitely. Hence in the counts given below only those cells are included in which the characters were quite definite. It is not an uncommon finding in exudates to have portions of fragmented nuclei lying amidst the debris of the exudate and at times much care must be exercised to differentiate some of these from very small lymphocytes. The squamous epithelial cells present the least difficulty of recognition. In no instance did we find coarsely granular eosinophiles, though polymorphonuclear leucocytes with acidophilic cytoplasm were encountered.

The cell counts as they were obtained in this series of cases are given in the following classified list:

GROUP I.

Clinically grouped as due to chronic Eustachian tube catarrh.

Case 1: Polymorphonuclear, 88 per cent; Lymphocytes, 4 per cent; Large Mononuclear, 3 per cent; Endothelial, 5 per cent; Epithelial, 0 per cent.

Large numbers of bacteria, both bacilli and cocci, were seen. The bacilli appeared to be of various kinds. The leucocytes were surrounded by a considerable amount of mucus in strands. The leucocytes showed degenerative changes.

Case 5: Polymorphonuclear, 95 per cent; Lymphocytes, 1 per cent; large Mononuclear, 1 per cent; Endothelial, 1 per cent; Epithelial, 2 per cent.

Moderate amount of mucous Leucocytes well preserved. Fair number of diplococci looking like pneumococci.

Case 8: Polymorphonuclear, 88 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 0 per cent; Endothelial, 10 per cent; Epithelial, 1 per cent.

There was a fair amount of mucus. A few bacteria were seen and there was some debris.

Case 9: Polymorphonuclear, 94 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 0 per cent; Endothelial, 4 per cent; Epithelial, 0 per cent.

thelial, 1 per cent. There was a moderate amount of mucus in the smear; some debris and a few bacteria.

Case 10: Polymorphonuclear, 94 per cent; Lymphocytes, 3 per cent; Large Mononuclear, 0 per cent; Endothelial, 2 per cent; Epithelial, 1 per cent. There was much mucus; very few bacteria.

Case 13: Polymorphonuclear, 81 per cent; Lymphocytes, 0 per cent; Large Mononuclear, 5 per cent; Endothelial, 14 per cent; Epithelial, 0 per cent. There was no mucus present. There were many degenerate cells and debris seen in the stained smear. A fair number of organisms, mostly diplococci, were present.

Case 14: Polymorphonuclear, 59 per cent; Lymphocytes, 26 per cent; Large Mononuclear, 7 per cent; Endothelial, 8 per cent; Epithelial, 0 per cent. There was a considerable amount of thick secretion with some mucous strands in the smear. Bacteria were fairly abundant, there being both bacilli and cocci present. Many of the cells showed fragmentation with liberation of nuclear masses from the protoplasm. A few red corpuscles were also present.

Case 16: Polymorphonuclear, 89 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 1 per cent; Endothelial, 9 per cent; Epithelial, 0 per cent. There was very little mucus present in the smear. The cells were well preserved. There were very few bacteria present.

Case 19: Polymorphonuclear, 93.5 per cent; Lymphocytes, 3 per cent; Large Mononuclear, 1 per cent; Endothelial, 2.5 per cent; Epithelial, 0 per cent. There were very few strains of mucus. The secretion between the cells was otherwise thin. There were large numbers of diplococci throughout the smear. The cells stained well. Columnar epithelial cells could not be recognized.

GROUP II.

Classified as due to chronic Eustachian tube catarrh, with secondary chronic inflammatory changes in the middle ear.

Case 2: Polymorphonuclear, 97 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 0 per cent; Endothelial, 2 per cent; Epithelial, 0 per cent. The leucocytes were well preserved, and there was a moderate amount of mucus. Bacteria were scarce.

Case 4: Polymorphonuclear, 96 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 1 per cent; Endothelial, 2 per cent; Epithelial, 0 per cent. There was a small amount of mucus. The leucocytes were well preserved. There were fair numbers of diplococci looking like pneumococci. No other bacteria were present.

Case 20: Polymorphonuclear, 86 per cent; Lymphocytes, 3 per cent; Large Mononuclear, 1 per cent; Endothelial, 9 per cent; Epithelial, 1 per cent. There was little or no mucous present, and bacteria were almost wanting, occasional diplococci being seen.

GROUP III.

Classified as showing extensive histological changes in the middle ear (Cholesteatoma, etc.)

Case 3: Polymorphonuclear, 85 per cent; Lymphocytes, 0 per cent; Large Mononuclear, 0 per cent; Endothelial, 1 per cent; Epithelial, 14 per cent. No mucus was present. There were innumerable bacteria of various kinds, including Vincent's fusiform bacillus and a spirochaete. Many of the squamous epithelial cells were devoid of nuclei. There was some debris.

Case 11: Polymorphonuclear, 85 per cent; Lymphocytes, 0 per cent; Large Mononuclear, 0 per cent; Endothelial, 0 per cent; Epithelial, 15 per cent. Some mucus and debris were present. There was a very large number of bacteria.

Case 12: Polymorphonuclear, 16 per cent; Small Lymphocyte, 6 per cent; Large Lymphocyte, 0 per cent; Endothelial, 0 per cent; Epithelial, 78 per cent. There was little mucus and some debris. No bacteria were present.

Case 15: Polymorphonuclear, 98 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 1 per cent; Endothelial, 0 per cent; Epithelial, 0 per cent. There was little or no mucus present. The pus cells were well preserved, and the protoplasm had acidophilic characters. Several polynuclear eosinophiles were found. There were numerous bacteria present, most of which were large bacillary forms.

Case 17: Polymorphonuclear, 94 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 1 per cent; Endothelial, 0 per cent; Epithelial, 4 per cent. The protoplasm of the polynuclear cells was finely granular and pink staining. There was a slight amount of mucus present. Bacteria were infrequent.

Case 18: Polymorphonuclear, 72 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 1.5 per cent; Endothelial, 3 per cent; Epithelial, 22.5 per cent. There was a great deal of mucus in which the cells of the exudate were embedded. The epithelial cells were scattered sometimes singly, and at other times in small plaques. These epithelial cells were at times without nuclei and formed thus homogenous "Squamae," not taking the basic stains.

Case 21: Polymorphonuclear, 82 per cent; Lymphocytes, 4 per cent; Large Mononuclear, 0 per cent; Endothelial, 5 per cent; Epithelial, 9 per cent. There were some strands of mucus throughout the smear. There were innumerable bacteria of various kinds present.

Case 22: Polymorphonuclear, 98 per cent; Lymphocytes, 0 per cent; Large Mononuclear, 0 per cent; Endothelial, 1 per cent; Epithelial, 1 per cent. The cells were not very numerous. There were some strands of mucus between the cells of the exudate. Very few bacteria were seen.

ACUTE CASES.

Examined for Purposes of Comparison.

Case 6: Polymorphonuclear, 98 per cent; Lymphocytes, 2 per cent; Large Mononuclear, 0 per cent; Endothelial, 0 per cent; Epithelial, 0 per cent. There was a considerable debris, and some Gram-positive diplococci, some of which were in short chains. No mucus was present.

Case 7: Polymorphonuclear, 63 per cent; Lymphocytes, 3 per cent; Large Mononuclear, 3 per cent; Endothelial, 31 per cent; Epithelial, 0 per cent. There was a slight amount of mucus, and fair numbers of bacteria were present, mostly diplococci.

Case 23: Polymorphonuclear, 91 per cent; Lymphocytes, 2 per cent; Large Mononuclear, 1 per cent; Endothelial, 6 per cent; Epithelial, 0 per cent. There was very little mucus present. The cells stained well. There were some bacteria, both cocci and bacilli, found in the smear.

Case 24: Polymorphonuclear, 88 per cent; Lymphocytes, 5 per cent; Large Mononuclear, 0 per cent; Endothelial, 7 per cent; Epithelial, 0 per cent. There was no mucus in the secretion. There were large numbers of bacteria, both cocci and bacilli.

Case 25: Polymorphonuclear, 60 per cent; Lymphocytes, 1 per cent; Large Mononuclear, 15 per cent; Endothelial, 24 per cent; Epithelial, 0 per cent. There was little mucus in the secretion. Occasional chains of cocci were present.

(By endothelial cells we refer to the large Hyaline non-granular cells.)

As will be seen from the above examinations there is little uniformity in the cell counts of the different types. The one prominent feature which is noted is that the polymorphonuclear leucocytes are almost constantly in the greatest number. These cells predominate in the lesions occurring in the various parts of the ear

and in the cases of varying intensity. In only one case did the lymphocytes appear in numbers up to 26 per cent, and this case had no particular features of chronicity. In fact, from the numbers of polymorphonuclear leucocytes and of lymphocytes we were not able to find any parallelism with the clinical features. On the other hand, the presence of epithelial cells in demonstrable numbers, was found only in cases of cholesteatoma. This is what we might expect from what we know of the disease.

The relative proportion of endothelial cells in the exudate did not give us any information as to the nature or progress of the case. It was first thought that their presence indicated chronically healing tissues, but this was not borne out when the cases were compiled. In none of the exudates examined by us have we been able to distinguish columnar epithelial cells as such.

In short, we are led to the conclusion that the cytological examination of ear exudates does not, save in the case of cholesteatoma, give any definite information as to the nature and site of the lesion, nor can the prognosis be foretold by this means.

One might say that practically in all cases of chronic suppurative otitis there is the predominance of polymorphonuclear cells. According to the contention of Dr. Milligan these should be regarded as acute cases and a favorable prognosis given.

Our experience has been that clinically some of the cases became quiescent, while others did not, according to the degree of success with which the condition of the Eustachian tube could be treated. In one case (Case II) a radical operation was performed on account of recurring attacks of pain and fever, but, although the ear spaces are now completely healed and the ear safe, there have been recurring periods of discharge from the Eustachian tube. In only one case (Case XIV) were the lymphocytes found present in considerable numbers. This is according to Dr. Milligan's statement an indication of chronicity and should be of weight in advising radical operative interference. This case was clinically grouped as one of tube catarrh and healed promptly after treatment of the nose and throat. It relapsed after two or three months, but quickly became quiescent as before. The only active symptoms in this case have been shown in small amounts of mucous discharge free from any offensive odor, which, however, have never been associated with pain or fever. In the few acute cases examined we can confirm Dr. Milligan's observation of the predominance of polymorphonuclear forms, but in view of our experience with the chronic cases this loses the interest which he would have us attach to it.

CLINICAL SYNOPSIS OF CASES EXAMINED.

Case No.	Age	Sex	Duration of Symptoms.	Probable Origin.	Amount and Character of Discharge.	Condition of other ear.	Remarks.
Group I.							Chronic Eustachian tube
I.	32	F.	2 years	Childhood	Small amount mucoid, no odor.	M. T. perforat	Clinically due to chronic Eustachian tube
V.	20	F.	12 years	Scarlatina	Mod. amount mucoid, no odor.	Under treatment improved, but did not heal.	Clinically due to chronic Eustachian tube
VIII.	22	F.	19 years	Scarlatina	Mod. amount mucoid, no odor.	Under treatment improved, but did not heal.	Clinically due to chronic Eustachian tube
IX.	22	F.	19 years	Scarlatina	Mod. amount mucoid, no odor.	Very persistent discharge without other symptoms.	Clinically due to chronic Eustachian tube
X.	45	M.	6 weeks		Mod. amount mucoid, no odor.	Very persistent discharge without other symptoms.	Clinically due to chronic Eustachian tube
XII.	18	M.	1 year		Mod. amount mucoid, no odor.	Normal	Became quiescent (old scars pointed to former otitis).
XIV.	28	F.	Indefinite	Childhood	Mod. amount mucoid, no odor.	Normal	Became quiescent, extensive destruction of M. T. (otitis in childhood?)
XVI.	58	M.	3 weeks		Small amount mucoid, no odor.	Normal	Became quiescent, relapses with small amount of discharge.
XIX.	8	M.	6 weeks	Otitis in infancy	Small amount mucoid, no odor.	Normal	Became rapidly quiescent (old perforation, childhood?)
Group II.							Periodical discharge and quiescence.
II.	16	F.	8 years	Diphtheria	Profuse, muco-purulent, no odor	Normal	Classified as due to chronic Eustachian tube catarrh with secondary chronic inflammatory changes in middle ear...
IV.	20	F.	12 years	Scarlatina	Small amount mucoid, no odor.	Case V.	Recurrent exacerbations with pain (radical mastoid operation).
XX.	49	F.	6 weeks		Mod. amount sero-purulent, no odor	Normal	Chronic hypertrophic change in mucosa of inner wall of tympanum.
Group III.							Scar of simple mastoid operation, performed 6 years before, became quiescent.
*III.	15	F.	Indefinite, about 5 years	Measles, at age 5 years	Profuse, purulent, foul odor	Normal	Classified as showing extensive histological changes in the middle ear (cholesteatoma, etc.)
XI.	15	M.	10 years	Measles	Mod. amount, foul odor	Case XII.	Cholesteatoma (radical mastoid operation).
XII.	15	M.	10 years	Measles	Mod. amount, slight odor	Case XI.	Cholesteatoma, still under observation.
XV.	14	M.	3 years		Mod. amount	Normal	Granulations in middle ear (passed out of observation).
XVII.	26	M.	14 years	Typhoid Fever	Small amount, purulent, foul odor	Normal	Cholesteatoma (radical mastoid operation).
*XVII.	17	F.	5 years	Measles	Mod. amount, purulent, foul odor	Persistent perforation.	Cholesteatoma (radical mastoid operation).
XXI.	51	M.	48 years	Otitis in childhood	Small amount, foul odor	Case XXII.	Still under observation.
XXII.	51	M.	48 years	Otitis in childhood	Small amount, slight odor	Case XXI.	Scar over mastoid, abscess in childhood.
Aente Cases.	29	F.	6 weeks	Acute Coryza	Small amount, no odor	Normal	Examined for purposes of comparison.
XXIII.	29	F.	6 weeks	Acute Coryza	Small amount, no odor	Normal	Patient had been examined 2 months before
VI.							Cases from autopsy where acute otitis was incidental finding acute suppurative otitis media without perforation of M. T.
VII.							2 months; cause of death, (acute suppurative otitis media?)
VIII.							1 month; cause of death, Acute otitis.
IX.							No tuberculosi
X.							No tuberculosi
XXV.							No tuberculosi

*Reported in detail, Montreal Medical Journal, December, 1909, p. 841.

A constant finding of interest was the presence of epithelium in the cases of cholesteatoma. We say of interest rather than of value for in such cases the diagnosis can usually be readily made by the macroscopic appearances of the discharge and frequently by its offensive odor. The epidermal flakes can usually be readily recognized macroscopically in the washings from the attic.

We believe, therefore, that the cytological examination of chronic middle-ear discharges cannot be regarded as having any value as a means of classifying or selecting cases for any particular form of treatment or in making a prognosis.

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Congenital Word-Blindness as a Cause of Backwardness in School Children; Case Associated with Stuttering. E. B. McCREADY, *Pa. Med. Jour.*, January, 1910.

McCreedy holds that although but 41 cases have been closely observed of this condition, the number represents but a small proportion of the cases. That there is a distinct hereditary influence there can be no doubt. In two of the cases reported development in other directions was slow, while other cases showed evidences of a neurotic tendency. In nearly every case the patient, with the exception of his visual defect, was of average or above average intelligence. In the case reported, the patient, aged 20, family history negative, had enteritis when an infant. At the age of 4 years he had an attack of pneumonia with cerebral symptoms. He had great difficulty in reading from the time he first went to school, and began to stutter from fright at the age of 10. He could recognize letters and numerals, but very few words. The boy is of average intelligence but much retarded on account of defects. The object aimed at after correction of the speech defect was the development of the visual word center in the right hemisphere, and the establishment of functional relationship between it and the auditory word center as well as Broca's center in the left. His improvement has been satisfactory.—*Jour. A. M. A.*

A NEW VESTIBULAR SYMPTOM IN DISEASES OF THE CEREBELLUM.

BY DOZENT DR. BARANY, VIENNA.

(Translated by Dr. M. A. Goldstein, St. Louis.)

When the Romberg test is applied in cases of left-sided rotary nystagmus of vestibular origin, the patient falls to the right. When the head is turned 90° to the right, the patient falls backward; when turned 90° to the left, he falls forward. This occurs in accordance with the law which I discovered that in disturbances of equilibrium of the vestibular apparatus, the direction of the fall is influenced by changing the position of the head.

Disturbances in equilibrium noted in diseases of the cerebellum differ from those of vestibular origin in that the strict relation between the character and direction of the nystagmus and the direction of the disturbances in equilibrium is lost.

For example, patient falls to the left with rotary nystagmus, or as frequently observed he falls backwards with horizontal or rotary nystagmus. In such cases of disturbed equilibrium, a change in the position of the head does not change the direction of the fall. Cerebellar disturbances in equilibrium have this feature in common with disturbances of equilibrium of hysterical or neurasthenic origin. In two cases of unilateral affection of the cerebellum (clinical observations) I have noted a reaction which may be of great value in the diagnosis of diseases of the cerebellum, especially for localizing right-or left-sided site of the affection. In both cases I tested the caloric reaction of the vestibular apparatus (Bárány) and found a typical, well-developed caloric nystagmus of both sides. The disturbances of equilibrium accompanying the caloric nystagmus were, however, atypical. The disturbances of equilibrium of the apparently healthy side could be influenced by changing the position of the head as above described, but on the diseased side equilibrium was not disturbed. One of these patients fell spontaneously each time in a direction backwards to the right. The right side was the affected side. I syringed the left side, hereupon he fell from head in erect position to the left. In turning the head to the right he fell forward, turning to the left he fell backward; entirely typical symptoms. The vestibular innervation of the left side was undisturbed. I then syringed the right side with cold water. With the head in the erect position he then fell

backwards to the right, and this direction was not influenced by the head position. Syringing the right side with warm water caused no change in the direction of the fall, while warm syringing of the left side produced the typical disturbances. The second case probably had a left-sided affection of the cerebellum, showing well-developed, spontaneous nystagmus to the left. The patient fell to the left instead of to the right. Hot syringing of the right side produced nystagmus to the right and the typical disturbances in equilibrium. Cold syringing of the left side also produced nystagmus to the right, the patient with head in the erect position falling to the left, and in turning to the left, fell backwards; but, turning the patient to the right did not cause him to fall forward, but to the left. If we wish to explain this theoretically, the following must be taken into consideration: The vestibular fibres extend to Deiter's nucleus; from here they continue along the route of the posterior longitudinal fasciculus to the nerves of the muscles of the eye and produce vestibular nystagmus. There are other fibers that extend from Deiter's nucleus to the anterior cornu of the spinal cord and produce the vestibular disturbances in equilibrium. Ascending fibres from the cervical ganglia bring about the influence which the position of the head bears to disturbances in equilibrium. Just how this influence comes about we do not know. It may originate in Deiter's nucleus, or, it may occur directly in the cerebellum, for numerous fibres from Deiter's nucleus may be found here.

The process which causes a change in the position of the head to influence the direction of the fall, must be very complicated. The impulse directed to the vestibular nerve must extend along entirely different routes to produce sensation or stimulation extending from the head and neck. Whether this complicated process takes place in Deiter's nucleus or whether a central organ (cerebellum) participate in its occurrence, I am not prepared to say. Clinical observations and animal experiments that I have already undertaken will perhaps explain the question. Be this as it may, we can appreciate the fact that diseases of the cerebellum which may also extend to lesions of Deiter's nucleus, may easily disturb this complicated mechanism. For this reason clinical observations of this mechanism by experimental stimulation of the vestibular apparatus, with syringing or turning of the body, give every promise of developing new symptoms to recognize the importance as well as the diagnosis of diseases of the cerebellum.

I. Bartenstein Gasse 4.

IN SITU ANTRUM TROCAR.

BY T. A. DICKSON, MOBILE, ALA.

Acute empyema of either left or right antrum can be irrigated daily or oftener if the specialist so wishes, by my invention of In situ Trocar. For a great many years I have used an in situ instrument for irrigation with perfect success in all acute cases. This instrument is so constructed that it can be used for diagnostic purposes or left in the antrum and irrigation performed daily. There is one smooth cannula, extra long, and two other fittings with a collar arrangement to push off the cannula when introduced. A small bump near the end of the cannula keeps the tube from being blown out by the patient. There is a fitting not shown with this outfit in illustration for fitting each cannula air-tight, rubber attached, and then syringe, fountain or otherwise, connected and thorough irrigation performed. The handle is long, with ball on end, allowing operator splendid grasp and excellent push for the work.



In treating these cases the tube will be found sometimes clogged and crusted with dry secretions. Before trying to fit part for irrigation it is well to soften crust and clean out well around end of tube. As the case progresses there will be very little secretion or crusts, so a fitting can be made at once. I have found this instrument valuable in saving patient considerable pain, loss of tooth, or operation. It has been used by me for six years and has given excellent results.

The present model was made by F. A. Hardy & Co., Chicago, and has been in use two years by other specialists.

The constant punching the antrum wall, as some operators do, hoping to find the same hole each time, is often dreaded by the patient and operator, not to mention the pain and inflammation set up by this procedure.

I would recommend this instrument to any specialist wishing an instrument for diagnostic work in chronic cases and for daily irrigation in acute cases.

203 Van Antwerp Building.

RETRO-PHARYNGEAL ABSCESS.*

BY E. W. CARPENTER, GREENVILLE, S. C.

The subject of this paper is an old one, but one to which very little attention has been given, probably because of its infrequency.

There are few conditions more difficult to recognize in their early stages, or more bewildering when seen in their full development. In the long experience of many busy men none have been observed, others have recognized only two or three, while many perhaps have gone their way unrecognized.

"The first mention of this affection dates back to the second century of our era, when Galen relates a case in his own experience. Since then no mention seems to have been made in medical literature until the middle of the eighteenth century; from which time until now very little has appeared in our literature." My attempt to review this subject was for several weeks disappointing. I could find only a few cases reported by Americans in short articles. Bokai of Budapest has collected over 500 cases, but I have failed to find a translation of his reports on these. There exists not even a monograph on "Retro-pharyngeal Lymph Adenitis," in English.

After reviewing most of the cases reported for the last eight or nine years in the medical library files of the Surgeon General at Washington, D. C., I have the assurance that I am not burdening you with a time-worn subject.

In referring to the etiology it is well to note the anatomy of the region. We find the three constrictor muscles overlapping each other and forming a large portion of the posterior boundary of the pharynx; between these are located a varying number of lymphatics, distributed to either side of the median line and differing in no material way from those which compose the rest of the chain known as Waldeyer's ring. This chain drains all the cavities of the face, nares, region of the Eustachian tube, pharynx, and is perhaps in direct connection with the lymphatics of the middle ear. Thus any inflammatory affections of these localities may cause an involvement of one or several of these glands.

Enlargement of the lymphatics has been referred to as idiopathic, but the etiology varies as the kind of infection, causing the primary

*Read before the South Carolina Medical Association, Somerville, April 22, 1909.

catarrhal disease. It is possible that any of the pus-producing organisms can be found in the involved glands.

Very few cases have been reported in adults. When present in adults they are generally due to traumatism, syphilis, or tuberculosis. The absence of these abscesses in adults is due to the early quiescence or atrophy of these glands. The vast majority are found in early life, few occurring after five years of age. At this period there is the greatest activity of these structures, and a large number of catarrhal diseases of the naso-pharynx.

The symptoms while characteristic, are frequently misinterpreted because most physicians depend on the ocular inspection which is always unsatisfactory in infants, whereas no aid is as capable of such unerring precision as the finger; though I am convinced in the future an electrically lighted laryngeal speculum will be of great assistance for diagnosis and treatment. The early symptoms are those of naso-pharyngeal catarrh. These persist and are followed by pain and refusal of all food and drink. As suppuration advances signs of obstruction become apparent, causing a modification of the voice, the quality depending on the location of the mass, interference with respiration, typical position of the head, namely, extension and rotation with the mouth widely open. At times in very young infants, labored breathing is the first indication of serious trouble. Just at this stage a broncho-pneumonia sometimes obscures the real issue.

The prognosis depends on the etiology. If, as in some cases the infection has extended from the middle ear with necrosis of the temporal bone, and extensive cellulitis and burrowing of pus in the neck, the results are not as favorable as where the purulent foci are limited to the pharyngeal structures and evacuation is accomplished before spontaneous rupture with the possibility of aspiration pneumonia, or asphyxia. A fair mortality rate is 5 to 7 per cent. I know of no special treatment that will influence these glands.

Frequent errors in diagnosis are: Simple rhinitis, diphtheritic paralysis, laryngitis, catarrhal or diphtheritic. Remember, if your finger is clean it causes very little discomfort, no pain and often much information is gained. It may prevent the opening of an aneurism with its fatal results. Malformation or malposition of the cervical vertebra will thus be quickly distinguished.

The method of opening the abscess depends on whether it is due to extension from the middle ear or not. If there co-exists a necrosis of the temporal bone it is advisable to make an attempt to remove it, either through an external incision in front of the

sternomastoid on a level with the larynx, or beginning at the tip of the mastoid posterior to the sternomastoid muscle, by careful dissection, the styloid process is reached, then the retro-pharyngeal area is opened. Unless there is extensive envelopment of the tissues of the neck, I favor the pharyngeal route because of the greater facility at the hand of the average man.

Care must be exercised in evacuating large collections of pus, because it may be swallowed, aspirated, or cause asphyxia. Probably the best position is with the child on a table, head much lower than feet and in pronounced extension. Then with the aid of the Jackson laryngeal speculum one can, under direct vision, use either a sharp-pointed scissors or knife for incising the mass. It is very important that an ample opening be made and the cavity should be packed if it is extensive.

The following case illustrates the danger of the mouth-gag: In an infant 15 months of age, after a delayed diagnosis and when cyanosis was threatening, a gag was introduced and cyanosis supervened; it was removed and the patient restored; again introduced and the baby became livid, stopped breathing, and was apparently dead. Artificial respiration, intubation, electricity, extubation and passing soft rubber catheter in trachea, through which no air could be forced until the bifurcation was reached. The abscess being situated very low down, it is possible that it was retro-esophageal and encroached on the whole trachea as well as on the larynx. The introducing of the gag causes a crowding backwards of the base of the tongue and surrounding structures; whereas the laryngeal speculum pulls them forward.

I have seen the following cases recently:

Case 1. W. M., aged 4 years, sick a few days with acute catarrh and tonsillitis. When I saw him on account of his refusal to swallow anything, mouth was constantly open, head extended and turned to the left, submaxillary, parotid and cervical glands greatly enlarged, both tonsils inflamed and protruding, right to a greater extent than left. All the pharyngeal tissues of a dark red color. Temperature varying from 101° to 104° , pulse rapid, quality good. Visual examinations of the throat failed to locate the trouble. I thought the condition was an unusually deep peritonsillar abscess and decided to return the next day, when the patient's condition was decidedly worse, I then introduced my finger into the upper and lower pharynx and discovered instantly a fluctuating mass low down on the right side extending over the median line and appearing to occupy the space from a level of the lower border of tonsil

to pyriform sinus. With the child in an upright position a sharp-pointed scissors was plunged into the mass, opened wide, withdrawn, and the child immediately inverted, when at least an ounce of very fetid pus escaped with slight bleeding. The child was so exhausted that it fell asleep in a few moments and recovery was prompt and without complications. The subsequent history of this patient has been very interesting but probably has no connection with this condition.

Case 2. Infant, aged 14 months. Its mother had just recovered from an attack of tonsillitis, when the infant had similar infection. It was sick a few days when breathing became obstructed. Expiration was not noticeably interfered with, but inspiration was crowing and high-pitched. I was called to do an intubation and was informed that anti-toxin had already been injected. Patient was in extremis and was rapidly becoming cyanotic. A hasty visual inspection failed to reveal any inflammatory condition in mouth or pharynx, but the finger recognized a fluctuating mass on right side extending over larynx and esophagus. A pair of sharply pointed scissors were plunged into the swelling, the infant inverted, and a large amount of horribly fetid pus escaped with free bleeding. This child was deep in the sleep of exhaustion before its cloths could be changed. Recovery was prompt and unimportant. This case is interesting because a diagnosis of pharyngeal diphtheria had been made and the house reported for quarantine.

Vaccine Therapy in Chronic Otitis Media. P. A. JACOBS,
Cleveland Med. Jour., Feb., 1910.

Jacobs resorted to vaccine therapy in six cases with the following results: Cured, 2; improved, 4; unimproved, none. treatment discontinued, 1; still under treatment, 3. These patients had not improved under the usual treatment. The vaccines employed were prepared after the method used in Wright's laboratory.—*Jour. A. M. A.*

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

December 22, 1909.

PRESENTATION OF PATIENTS.

Case of Laryngo-Scleroma. By H. ARROWSMITH, M. D.

DR. GUNTZER, referring to Dr. Arrowsmith's case, said that one could hardly make a diagnosis of rhinoscleroma from the clinical appearance alone. There is nothing positive in this case, though bacteriological and histological examination would probably be made later and help the diagnosis. Laryngeal cases are very rare. Out of one hundred cases reported by Baurowicz, six only were primary laryngeal cases. As far as treatment is concerned, he has had some success with an autogenous vaccine treatment, but much has been accomplished by the X-ray, and many who have tried it speak favorably of it; he himself, however, has had a few cases under observation since a year ago last spring, and does not feel that they have been benefited by the X-ray treatment. He intended, however, to give it a little longer trial.

- (a) **Rodent Ulcer of Nose and Face, Treated with Radium.**
- (b) **Large Gumma of Nose and Accessory Sinuses.**
- (c) **Breaking Down of Nose After Submucous Resection.**
- (d) **Total Adhesion of the Soft Palate and Pharyngeal Wall.**

By WOLFF FREUDENTHAL, M. D.

Case 1. The patient with gumma of the antrum and frontal sinuses could not be presented, as he was too sick to come out. The history of the other case with rodent ulcer dates back eight years, when the patient was sick while in Russia. At that time he had a papule, which appeared on the upper lip, and broke down later, discharging a serous fluid. He consulted many physicians and finally went to a barber, who cauterized the lip so energetically that he "made a hole in it." That was extensive enough to necessitate a plastic operation, the scars of which can be seen to-day. The patient felt well for some time until the trouble commenced again. He has now been troubled for several months with this

condition of his lip and nose. (The doctor presented a picture showing the condition of the lip and nose).

After trying many things without any effect, it was finally decided to give him radium treatment, which was applied for *twenty hours*. The radium was contained in a small tube, and was kept in place by a bandage. Ten mgr. of the radium were used, having a radio-activity of 1,000,000. After that all diseased tissue was very markedly ulcerated; there were deep ulcerations on these two parts of the nose and way down on the lips, but those were benign in character. After cleansing them and applying boric acid and zinc salve, they healed very well. There was a small place, on which radium was applied again for an hour, with a very beneficial effect.

Case 2. The other patient was brought to compare the effect of the radium on the skin and the mucous membrane. This patient was shown last month by Dr. Braun as a case of rhino-scleroma. Radium was applied in the right side of the nose, with the same result, which is uniformly obtained when it is applied to the interior of the larynx. The granulations sprang up immediately. The first time the radium was applied for ten minutes, and after that for from fifteen to twenty minutes, altogether six times. If you look at the right side of the nose you will see that it is built up by granulation tissue, which came up rapidly after the application of the radium. If this treatment does not eventually succeed, the only thing to do is to apply the Röntgen rays.

Case 3. This case was demonstrated on ten months ago as total atresia of the pharynx. The young woman applied for treatment, accompanied by her family physician, and adenoids were found and removed by her physician. After this he reported that she had difficulty in breathing, and upon further examination a beginning of incipient atresia of the pharynx was noted. Immediate operation was advised, but this was refused, and in a very short time there was a total atresia of the pharynx. When she was demonstrated on the previous occasion, Dr. Harris had called attention to the fact that another case had been reported in French literature, where a physician had operated for adenoids, which was done so energetically that atresia of the pharynx followed. Our patient here was operated upon the first of last May, an incision being made through the adhesion and a communication established between the nose and pharynx. Then a strip of gauze was passed through the nose and mouth and fastened to the lip, thus pulling

the soft palate anteriorly. This was left in for three days, when sloughing commenced, and fearing that the whole tissue might be lost the gauze was removed. For two weeks or so the parts were dilated twice a day with a probe or finger. After Dr. Freudenthal left for Europe Dr. Braun saw the case frequently, and now the pharynx is perfectly free, and the patient's voice is very good.

Case 4. The last case had been operated upon some three months ago in Pittsburg for some trouble in the nose, probably a submucous resection was made; later the condition became worse, and when the patient came to Dr. Freudenthal there was no breathing space on the left side. Three months after the operation the patient began to feel pain in his tongue, and it was twice or three times the size that it is at present. He could hardly speak; could eat nothing at all, and was not able to close his mouth. There was a very decided glossitis, and there was this serpiginous ulceration of the tongue. It is very rapidly getting better under very simple treatment, propaesine being applied. The patient has also a lesion of the right upper lung, so the condition is probably tuberculous.

At the request of the Chairman, Dr. N. L. WILSON said that a case of vernal catarrh of the conjunctiva had been presented at the eye section. The papillae of the conjunctiva were very much hypertrophied. The case was sent to Dr. Abbe for application of radium. Six applications were made to the right eye-lid and it was perfectly smooth. The left lid had been left for comparison and the contrast was marked.

DR. HARRIS said that the question of the action of radium and its use in laryngology is so important that the results with it should be put on record. It would help all who intended to try it in various important cases to know whether to expect good results, and he hoped that all who were using it would report their results, and that they would be able to report successful ones. He himself had been much impressed by what Dr. Freudenthal and Dr. Abbe had said of radium, and felt that there was something in it. His faith in the X-ray, however, had been shattered. The eight cases treated with radium, reported by Dr. Freudenthal, had shown good results.

DR. QUINLAN inquired whether there was any history of syphilitic infection prior to this condition. He has seen two distinct cases following traumatic interference and laceration of the soft

palate, and extensive injury of these parts that would result in such a condition. He has now under observation two cases which were caused by the efforts of a tyro in invading this domain which should be relegated to the expert rhinologist. These things sometimes follow unskilled invasion. He would like to know whether the present case was the result of a specific invasion, or of a traumatic invasion.

DR. WILSON inquired whether the operation was done with forceps or curette.

DR. BRAUN said that for six months after the removal of the bulk of the mass from the nose, the condition was quiescent, and then, without apparent exciting cause, the soft tissue began to spring up from the floor of the nose. The growth seemed to be more rapid under the influence of the radium. It acted very much like a carcinoma after incomplete removal. The effect of radium is to produce a hyperemia of the parts, and then, if the cells have not much vitality, to cause a destruction of the tissue. If the cells have sufficient vitality to resist the destructive action of the radium, there is an increased growth, due to the increased nutrition of the parts.

DR. QUINLAN inquired whether the case of glossitis was tubercular, and what treatment had brought about the rapid ulceration seen at present.

DR. FREUDENTHAL said that he had simply swabbed and cleansed it, and applied propaesine.

DR. QUINLAN replied that when such sites are affected the condition is a very grave one, and that this regeneration is a very remarkable one—almost without record.

DR. CARTER inquired whether the question of specific disease had been entirely eliminated in this case. The falling in of the bridge of the nose after operation would suggest syphilitic infection, for it does not fall in after submucous operations unless there is some syphilitic complication, or the operation has been done in a very unscientific manner. Dr. Carter said that he considered the case one of syphilis.

DR. SIMPSON said that he had seen a beginning gumma of the septum mistaken for a septal enchondrosis, upon which an operation had been contemplated.

DR. FREUDENTHAL replied that in the case of atresia of the pharynx, the history had not been given to him when he presented the patient a year ago. There was a doubt whether she was suf-

tering from inherited syphilis, and she was put on antispecific treatment, but it was clear afterward that the whole condition was traumatic. He could not say what instrument had been used, but the operation was very roughly done.

The case of glossitis seemed to be tuberculous, judging from two facts—the involvement of the right apex of the lung, and the absence of any signs of lues in any part of the body. The Noguchi test was made, but proved negative. He had never seen any similar lesion, and did not know what it could be unless it was tuberculous.

Multiple Papilloma of the Larynx. By HARMON SMITH, M. D.

The patient, a boy, was admitted to the Manhattan, Eye, Ear and Throat Hospital, October, 1907. He was then five years old. Previously he had been in Bellevue and other hospitals, where papilloma had been removed. He was brought to the Manhattan Eye, Ear and Throat Hospital because he snored at night, and was admitted for the removal of adenoids and tonsils. While the child was protesting against administration of the anesthetic, Dr. Smith noticed that his voice was very hoarse, and when he was under the influence of the anesthetic the larynx was examined and found to be full of papilloma. The case is now well, and was presented a second time to demonstrate the satisfactory disappearance of the growths and the perfect condition of the larynx.

A few days after the removal of the tonsils and adenoids a tracheotomy was performed, and subsequently a number of the papillomata were removed with the Jackson tube, and other instruments. As fast as they were removed they would reappear. Whenever the mucous membrane was injured the papilloma would spring up on the ventricular bands and adjacent mucosa, until at the end of the year the larynx was filled with papillomata and presented the appearance shown in the photograph. It was therefore thought advisable to discontinue the operative procedures, and various local and internal measures were resorted to, but with no effect. The tube was left in the trachea altogether for eighteen months. After leaving the larynx alone and giving it rest, the papilloma disappeared. At the last operative procedure fulguration was used, which is nothing more than the hot spark from a high frequency coil, but from this time they began to disappear.

The child left the hospital and returned to the clinic at stated intervals, and the warts all disappeared, with the exception of one piece on one of the vocal cords. He returned two or three months

ago to have a plastic done, and to have this remaining piece removed from the cord. This was done with good results. The voice has returned, there has been no recurrence of the papilloma, and the present condition of the larynx is as you have seen.

DR. FREUDENTHAL said that if he were asked his opinion of the case he would say that it was pachydermia of the larynx. He was very glad to have seen the case, and hoped that at the next meeting the result of the bacteriological examination would be submitted.

DR. HARRIS congratulated Dr. Smith on the result obtained in this case. Laryngeal obstructions in children are among the most difficult cases we are called upon to treat, and the results are usually very discouraging—especially these multiple papilloma of the larynx. There seems to be no rule to follow as to whether they should be treated by intra- or extra-laryngeal methods, or whether they should be left alone entirely. In this instance the result was obtained by desisting from radical measures.

He cited a case seen last summer where there was quite a different result. The child had been tracheotomized for dyspnea, and the tube was left in for a number of months. At the end of that time there was no improvement, and it was decided to open the larynx and remove the growth from the outside. This was done, and the operation was very successful—but in a very remarkable way there was a fatal termination, and it seemed to be because of a peculiarity with which some of the other members had also met. The child seemed to have difficulty when the tube was taken out, and his life was saved only by the rapid reintroduction of the tube—usually a smaller one. Three or four days after the operation the wound was doing beautifully, and the tube was taken out, and in attempting to get it back the child asphyxiated—one of the saddest and most unexpected results he had ever known. He had seen two cases where the child wore the tube right along, and then had difficulty in breathing when the tube was removed, and it seemed impossible to re-insert the outer tube.

DR. N. L. WILSON cited an experience similar to that mentioned by Dr. Harris. He said papilloma of the larynx almost always recur, and the only good results have been obtained by inserting the tracheotomy tube and leaving it in for eight to sixteen months. In one case that he knew of the tube was left in for eight years, and the cases all got well. In one case he had to take the tube out himself and hold the wound open with retractors each time

it was dressed, and by careful manipulation he succeeded in getting the same tube back. He thought the child would have died if this plan had not been followed.

DR. CARTER said that he had seen the case when it was first presented at the clinic. It was the worst case of papilloma of the larynx that he had ever seen. Several times during treatment the patient was very near death. It was a most instructive case. If fundamental principles of treatment of papilloma of the larynx in a child could be established from one case, this one certainly would prove that purpose. It demonstrated two principles; one, that surgical treatment of papilloma of the larynx in a child is not effective, for even though the larynx was at rest while it was being treated surgically, the growth did not get better but actually increased. The second deduction made in this case is that rest for the larynx is the proper treatment, for as soon as the larynx was given complete rest, and surgical interference was discontinued, improvement began. This treatment differs markedly from that in papilloma of the larynx in adults. In two cases of the latter one removed a year ago and the other three years ago, the growths have not recurred.

DR. QUINLAN recalled the fact that some years before he had read a paper before the Section in which the subject of papilloma in children had been discussed, and would repeat now what he had said then, that one of the best measures is putting the nostrils and upper air tract in good condition. He had never yet seen a child with papilloma who did not have some trouble with the upper air tract—something that brought about continual irritation; there is pharyngeal and laryngeal tenesmus, there is fluid flowing down and keeping up a constant irritation of the mucous membrane, and this granulation tissue is the result of the excoriating discharge. One of the most effective measures after the ichorous material has been cleaned out is to thoroughly clear up the air tract and allow the child to breathe naturally through the nostrils. He has seldom had occasion to operate twice on such cases. He has put the patient in a restful condition, eliminated the nervousness, taken away the tenesmus, and nature has regenerated the diseased conditions.

DR. SMITH said that when the case was under his care there were also in the hospital two older children with multiple papilloma. The picture he showed was that of a little Italian girl whose case was treated in the same way, and she left the hospital after the removal of the tube. Her voice is perfect, and when seen last her larynx was clean and she had a very good voice. The other case was a papil-

loma of the larynx in the anterior commissure, which projected forward in a tongue-like mass. This case has been under observation at the hospital for five years. A piece was pinched off at frequent intervals, which followed Dr. Wright's suggestion that if this is done the warts will ultimately go away. However, there had resulted quite a thickening between the cords of a fibrous nature which seemed to increase rather than diminish.

Replying to Dr. Harris' question relative to the dangers of the trachea collapsing after removing the tube, he said that where anything is substituted for nature's methods the natural function of that organ ceases. The purpose of the tracheal rings is to hold the lumen open, and when the tube which has been doing that as a substitute is removed, the tracheal rings having no duty imposed upon them lose their elasticity and collapse.

Case of Laryngeal Growth. By H. D. BURNHAM, M. D.

Dr. Burnham said that the condition was a multiple growth of the left side of the larynx, probably cancerous, involving left cord and left false cord and extending back of cords on left side with much congestion of right cord. The patient is 68 years of age, and says that the lesion first developed a year and a half ago, when he noticed that every once in a while he would lose his voice for an instant, and the periods of loss have increased in frequency and length during the past year and a half. But never for more than a few hours up to three months ago; then he lost his voice entirely, and now he can only speak in a whisper. He has always had good habits, except that he smoked from eight to ten cigars a day, and has been a pretty constant user of alcohol. He was dock manager in Florida a number of years ago, but has done lighter work for years. The place where he lived while dock manager was a low-lying malarial section. He has now only a third of his breathing space left, and suffers great difficulty in breathing, especially when going up and down stairs. Although there is no specific history, he was put on iodides and anti-specific treatment, without any benefit; and several applications of silver nitrate have been made. Also 1 per cent adrenalin chloride applications every day. Urine normal. Blood test weakly positive.

DR. QUINLAN said that he would like to see a microscopical report of the condition. He was inclined to think that it was some malignant invasion. The dirty gray ulceration, and the peculiar infiltration of the larynx would show that it was not an ordinary papillomatous involvement; the pain, the swelling, and other features

would suggest that it is not papilloma, nor are they common in advanced years. There seems to be an isolated area where this dirty grayish mass is situated.

DR. MCCOY said that he had seen Dr. Burnham's case, and agreed with what Dr. Quinlan had said about it. He was inclined to consider it a carcinoma which has not yet extended beyond the box of the larynx. It would seem to be a favorable case for laryngectomy.

DR. BURNHAM had nothing to add to what he had already said, except to call attention to the fact of the compensating abduction of the right cord. Three days ago there was a little movement in the whole mass during breathing, which he had not observed a week ago, and did not notice to-day at all. There must be some effort in abduction with such a large growth completely filling the normal space.

Double Frontal Sinusitis, with Pathological Complications. By R. C. Myles, M. D.

DISCUSSION.

DR. HURD said that he had nothing to add to the discussion, but would like to call attention to a case now in the hospital—a girl 23 years old, who two years ago had an attack of gripe with sinusitis, and since then had pain and pus in the nose. There was no history of any other disease. He removed, intranasally, middle turbinates, but with no result. Two months ago he did an external operation on the left side, cleaning out the ethmoids and sphenoid. She did well for three weeks, when she reported at the office with pain and a swelling of the inner corner of the eye on the opposite side. He had intended to operate on the left side in a few days. She was sent to the hospital, and the third day afterward he operated, and found evidence of a chronic sinusitis, and half way back in the ethmoid he found a half dram of pus under pressure. There was a swelling between the eyes and across the nose—rather edematous, no pus appearing through the bone at any point.

He cleared it out and left it open for forty-eight hours, and everything was doing well, except that she had some swelling across the forehead. On the third day a septal swelling was found. The wound was then closed, and everything went on all right except that she continued to have this broadening of the root of the nose. Three or four days later he inserted a knife into the swelling in several directions, but could find no pus. She ran a temperature of 101 degrees to 102.5 degrees for several weeks. Dr. Wright was called in consultation, and he thought that she had meningeal in-

volvement, and advised fresh-air treatment. That night, however, she ran a temperature of 103 degrees, with increased headache. Then he opened up the right side again and found that the long bridge was necrosed with a sequestrum which included the left frontal bridge nasal bones and septum, between frontal sinuses; also that there was an area about the size of a silver dollar on frontal bone, that was dead. The sequestrum was removed. The granulations were sent to Dr. Wright for examination, and he says that there was a suspicion of syphilis about the walls of some of the arteries. For a week she went on with some temperature 100-102 degrees, considerable headache at night, but little in the day. A small abscess was found in the soft tissues, which was thought to account for headache and temperature, but both persisted until one morning she suddenly became delirious; the wound was immediately enlarged and the frontal bone explored. A soft spot was found at the external end of the right frontal ridge and the bone here was chiseled through and an epidural abscess was opened, which extended upward three inches and had ruptured, causing a general pachymeningitis; death followed on the fifth day.

DR. MACKENTY agreed with what Dr. Myles had said. He did not believe that it was possible to remove adenoids thoroughly with the curette, and he had used it only after the forceps to finish the operation. It is important to remove the adenoid tissue from Rosenmüller's fossae, and this cannot be done with the ordinary curette. He has devised a small instrument consisting of a fenestrated thimble, with a cutting knife set at right angles to the palmer surface, so that the knife enters the fossa of Rosenmüller and cuts the tissue out. In removing the faucial tonsil it should be grasped with a hook or other instrument and drawn in before the pillars are separated, as the tension makes the separation easier. He does not believe in the use of dull instruments in any operation, for they are apt to tear and cause traumatism.

There is less danger of subsequent infection in a clean-cut wound since the lymphatic vessels and cell spaces are left wide open for drainage, whereas in bruised and torn wounds the reverse is true. Healing of the tonsillar wound is quicker and less painful after the use of sharp instruments.

Observations on Tonsillotomy. By N. L. WILSON, M. D.

DISCUSSION.

DR. ARROWSMITH said that Dr. Wilson had accurately quoted his opinions in regard to tonsillotomy. There is a very decided differ-

ence in conditions, and in many cases a tonsillotomy is all that is necessary. There are a large proportion of cases where thorough enucleation is imperative. The subject, however, was too large a one to be properly discussed at so late an hour. Dr. Wilson had, however, criticised the taking out of the adenoid tissue before removing the tonsils, but he himself did not feel any special anxiety about losing the tonsil in the throat; he had never seen any harm result from this procedure.

DR. HOWE said that in the Methodist Hospital in Brooklyn, the patient is anesthetized, placed in a horizontal position, with the head somewhat pendant over the end of the table. The gage is inserted in the right side of the mouth and the tongue grasped with tongue-forceps and well drawn out. Both are held by an assistant. The operator stands directly behind the patient. The index finger of the left hand is introduced into the postnasal cavity to explore the nature of the growth and to direct the instruments used in removing the adenoid. As much of the mass as possible is first removed with French forceps. The curette is afterwards used to remove any material which the forceps cannot grasp. The post-nares is then firmly packed with gauze to stop hemorrhage. The tongue is then released, pressed upward with an angular tongue depressor by the operator and the tonsils freed from the pillars by a blunt or sharp hook. The index finger of either hand completes the enucleation of the tonsil as far as possible. Traction is then made on the tonsil and it is removed by a McKinzie tonsillotome or scissors. In some cases a Matthews' tonsillotome with external pressure quickly and easily completely enucleates the tonsil. If the first attempt does not remove sufficient tonsillar tissue, the anterior pillar is held forward and tonsillar bed readily cleaned out with a tonsillar punch. The post-nasal packing is removed. The tonsillar hemorrhage is readily stopped by the index fingers placed back to back with the tips over bleeding point.

DR. NEWCOMB said that he would like to speak of the success obtained by the use of the finger as a separator. Dr. Matthews, who read a paper on the tonsils at the meeting of the Roosevelt Alumni, did not claim it was anything new on his own part or that it was universally the best method of removing the tonsil. He had tried it and found it very satisfactory; in some instances you can strike the plane of adherence the first time and can remove the tonsil very well, in others you cannot, and have to use other instrument separators and tonsillotomes. He himself did not believe in using

chloroform anesthesia, and thought that the men who used it would sometimes have bad results.

DR. HURD said that he had used the upright position for over ten years and had never had an ill effect from it. One patient had a tobacco heart, and had to lie down again, but other than this he has never had any trouble. There is less hemorrhage, and he can see better and use his hands to better advantage than when the patient is on his back. He has tried both postures, and always in his private practice he has the patients upright. As to the indications for removal, he does not think that every large tonsil should be taken out. The size of the tonsil has nothing to do with it. It is a question of the infection of the tonsil, and not its size. If the cervical glands are simply enlarged, they will go down after a few weeks. If they are tubercular, they will not.

DR. CARTER emphasized the importance of complete liberation of the pillars before removing the tonsils by means of the snare, especially the posterior pillars. During the past year he has seen three cases where enough of the posterior pillar was removed to cause regurgitation through the nose when the patient swallowed. These cases did not occur in his own practice.

With reference to the presence of enlarged glands in the neck—during the past he has, in every case requiring tonsillotomy in private practice, examined to see if there were enlarged deep cervical glands. These glands, situated around the internal jugular, are of great surgical importance, and in the great majority of cases where they can be felt he is in favor of tonsillotomy. Any palpable lymphatic gland is diseased. He had found that the glands diminished in size, and in some cases could not be palpated six months after the operation had been performed.

DR. McCoy said that it seemed to him that Dr. Wilson was trying to swing the pendulum in the other direction; that he felt we had been too radical and thought we should be more conservative. Dr. Wilson had tried to make out a strong case for the tonsil as a functioning body, but he did not think he had succeeded very well, for while the tonsil may have certain functions, still, as the result of the large number of tonsils that have been removed in the past few years in the crusade among school children, we have noticed no bad results, although doubtless many tonsils have been removed unnecessarily. The doctor had said that the blood was kept in a better condition for defence, but we have not heard that the children were more easily affected by disease after the removal of the

tonsils. In private practice there are generally very good reasons for the removal of the tonsils. There is some trouble in the ear, in the throat, or in the tonsil, and there are usually very definite reasons for surgical interference. Personally he does not believe that it is necessary to take out every tonsil we see, but where there is any doubt he would prefer to take them out rather than to think about their functioning qualities. He thanked Dr. Wilson for the kind reference to his own method of operating, and joined with him in his condemnation of chloroform, but those working in clinics could not always do just as they wished. He believed every child so operated should be kept in the hospital for twenty-four hours. In his private work ether was always used.

DR. WILSON, in closing the discussion, said that Dr. McCoy had struck the keynote when he said the profession had gone too far in the radical direction. While perhaps he had not made out a strong case for the tonsil as a functioning organ, we do not yet know what the results of the wholesale removals will be. We have not yet done nearly enough enucleations to know what will occur after a few years. We should select our cases and not enucleate every case. If there is anything in the theory that the tonsil is a protection against infection, and that it is a functioning organ, we should give the children the benefit of it. Many men use forceps for the removal of adenoids. He himself, however, still adheres to the opinion that with various-sized curettes and the finger you can take out every vestige of the adenoid tissue. The member who had spoken of taking out the adenoids, tamponing and then operating on the tonsils, would seem to be going to much unnecessary trouble, for if he takes out the tonsils first and then the adenoids it would be better for operator and patient.

Tonsil Enucleator. By JOHN MCCOY, M. D.

This instrument is intended for use with adults. In children the finger method of enucleation seems more advisable, but in adults it is a great help to have an enucleator, which will remove the tonsil thoroughly and with as little traumatism as possible. In manipulating the tonsil after the anterior pillar has been separated, it enucleates very nicely until we strike the posterior pillar. There it is often firmly attached. There is a blunt enucleator, which has a concealed knife, so that it can cut through the posterior pillar. The instrument can be used on both sides in the same way.

New Method of Packing the Nose and Naso-pharynx. By L. M. HURD, M. D.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular meeting, held December 14, 1909.

DR. HENRY GRADLE, CHAIRMAN.

Case of Death on the Operating Table. By J. C. BECK, M. D.

A man, thirty-five years old, was admitted to the Cook County Hospital, with a history of either meningitis, intoxication from alcohol or a narcotic. Later the diagnosis of meningitis was made, because of the presence of a running ear, stationary pupils, slight rise of temperature, vomiting, drowsiness, and the absence of other general symptoms. I saw him on the following day and made a diagnosis of probable serous meningitis from middle ear trouble, and advised operation. The patient was prepared, ether was administered, and in twelve minutes the man was dead. All attempts at resuscitation failed. Autopsy: The brain was normal. The temporal bone showed a necrosing mastoiditis (demonstration of temporal bone). The remaining portion of the mastoid was sclerotic, but the tegmen was free from disease. Chest, negative; abdomen, negative except for the absence of the left kidney from its usual place. The right kidney was cystic. The left kidney, which was very small, was found at the left sacro-iliac joint. Its ureter measured only $3\frac{1}{2}$ inches in length. Histological examination showed very little good functioning structure in either kidney (demonstration of kidneys). It is, therefore, very likely that the patient had uremia at the time of admission, although the urine analysis was given as negative as to albumin. I believe that the small quantity of ether administered aggravated the process and caused death more quickly than if patient had been left to complete the usual course of a state of coma. I must add that this post-mortem was made by Dr. Hunter, the expert necrologist of Cook County Hospital, who tells me that this interesting finding of the left kidney occurs very seldom.

DISCUSSION.

DR. J. HOLINGER: It seems to me that there is a possibility for reasonable doubt whether uremia was really the cause of death in this man. There was no symptom pointing to uremia during life-time, and the kidneys as I see them here do not exclude normal

function. I do not think that a deformed kidney is necessarily a badly functioning kidney. There are no acute or recent changes which explain why he should have died *now* and not twenty years ago of uremia. The fact that no albumin was found in his urine certainly supports this view. I may be mistaken as well as not, but the reason for my skepticism is the following case:

Many years ago I performed a post-mortem on a woman, who died of pneumonia of several lobes at the age of 36 years. No kidneys were found in the renal region, but instead an irregular mass of kidney tissue over the sacrum with the ureter, about two centimeters long, leading directly into the bladder. The woman never had any urinary symptoms, no uremia or anything pointing to kidney disease could be found. She had a normal heart. There was in this case absence of the vagina, uterus, ovaries and tubes. Between the bladder and rectum was a broad ligament of connective tissue, and some thickening in the middle, and on both sides, representing the only trace of genital organs. Nothing in the woman's history pointed to this condition before her death.

DR. BECK (closing): One kidney in the stage of cystic degeneration and the other kidney small, with an absence of normal kidney structure, is extremely suggestive as to the patient having died from uremia rather than from any other cause. After twelve minutes of slow administration of ether, death could not be ascribed to the anesthetic. I reported the case because the findings were so misleading.

The Septal Spur and Its Removal By F. G. STUBBS, M. D.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

Resections of Bony Deflections. By OTTO FREER, M. D.

DISCUSSION.

DR. J. E. RHODES: With reference to the denudation of the crista, I have found the raspatory an all sufficient instrument. The overlapping of cartilage, spoken of by the essayist, is sometimes very puzzling, and denudation of the spine is very difficult until this overlapping is appreciated. When that is taken away, it is possible to get under the periosteum of the ridge after cutting along its crest. It is a very broad statement to make, and yet it is a justifiable one, that all bony deflections or abnormalities of the septum can be corrected by means of submucous resection. Many of the operations formerly performed are now obsolete. The preservation of the mucous membrane is all important, and by making

a resection with that end in view, we are doing good to our patients instead of harm, even if we take away more bone than is necessary to get free passage in some cases. I think Dr. Freer's idea is to make as perfect an operation as possible, and to that end the open method, with the reversed L flap he advises I have found adequate, inasmuch as every stage of the operation is done under the direct inspection of the eye.

DR. C. M. ROBERTSON: I have been sawing off spurs all my life, and I have never had scab formation after the operation. I believe in saving the mucous membrane, and in any case where the ridge does not ascend too rapidly, you can introduce a saw, going through the bone carefully so as not to cut through the mucous membrane above it. After you get through the bone, if you will tip the saw outward, you can separate the upper part of the bone from the mucous membrane, grasp it with forceps, and peel it out. In that way you can do a submucous operation with the saw, saving the mucous flap. It is not necessary to trim the flap, because if too much membrane to cover the wound is left at the lower border of the flap, it will slough off in a few days.

Where the septum rises rapidly in its deflection, you cannot use the saw, but must take the spur out in some other way. The Hajek chisel would be all right, although I would not like to have it used on me. There is always a jarring sensation of which patients complain. The chisel is also dangerous at times, because the septum will splinter. The same thing occurred with the old spoke-shave. I cannot see that the chisel has any advantage over the spoke-shave, where you place the instrument behind the spur and pull forward, the reverse procedure being employed with the chisel. It all depends on the operator whether or not a smooth surface is secured. It is impossible to make a concavity, in the manner mentioned by Dr. Stubbs, because you cannot tell how much the tissue will fill up. When we paid no attention to saving the mucous membrane, I saw patients in whom the spurs removed occupied a space one inch long and one-half inch high, with no thickening at all, and years afterward the mucous membrane could not be told from normal mucous membrane. There are certain conditions where the submucous resection is not indicated. Where there is an angular deflection, and the obstruction on the convex side can be relieved, by reflection of the septum, the old saw operation is good enough. Of course, when the deflection is irregular, the submucous operation is the only one. I have had the experience

of apparently cutting down on a spur, thinking I was on the floor of the nose when I was not. I had a marked case recently where the day after the operation I was surprised to find that the entire lower angle had been left in the nose. There are many of these cases of angular deflection with a piling up of the crest. I have sawed off the crest and done a flap operation on the mucous membrane, getting a perfectly straight nose, just as in the submucous operation.

DR. J. C. BECK: I have made some examinations of spurs and ridges removed by the submucous route, (demonstration of a histological section), and invariably I have found an explanation of failure in sawing off a ridge and leaving it exposed to infection. The formation of new bone from the embryologic structures present is demonstrated. The work outlined by Dr. Stubbs is the same as that carried on by me for several years, with excellent results. I think that most of us do not make a submucous operation, but are satisfied with such a procedure as he outlines. These ridges show considerable cartilage and the formation of new bone from this cartilage, a rapid increase in the cartilage cells, with new bone-cells forming at the junction. One can see, how simply sawing off a ridge will form a new ridge. To do the operation as it is done by Dr. Stubbs, infection and subsequent bone formation will be prevented.

In regard to the submucous operation, I have had considerable experience with it, and am satisfied that the incision, as outlined by Killian, extending it far down to the floor, is, in the majority of cases, sufficient. Reading Neumann's idea, as to the periosteum crossing over the ridge, explains to me the many tears I have made in removing the ridge. In splitting the periosteum over the ridge it is easy to dissect it on both sides and remove the anterior portion of the maxillary ridge. Posteriorly, there is no difficulty in cutting out the bone. I have been using the Killian forceps, breaking out the bony septum. The patient does not complain of any after-effects from this so-called brutal method. In fact, the breaking is done gently and then the bone is removed between the mucoperichondrial flaps.

DR. EDWIN PYNCHON: I think that most of us cannot always report as favorably as Dr. Robertson has on the removal of ridges with saws. I have had many patients come to me who had been operated on by others and there has been in the nose at the site of

the ridge an area which did not heal properly; the mucous membrane was chronically irritated.

About twenty years ago Dr. Rice, of New York, read a paper on the treatment of chronic septal ulcers in which he recommended massage. I might say that in that we had a solution for the imperfect healing of a wound after the removal of the ridge by the sawing operation. It is my belief that in the ordinary method of healing the membrane forms simultaneously over the entire area of the wound. Dr. Rice's theory was to massage it, so as to restrict healing in the center and stimulate healing at the periphery; in other words, to cause the wound to heal from the periphery to the center. In these cases I have been pleased with the results.

The suggestion Dr. Stubbs made as regards making a slight depression, as much as possible, over the area of the tissue removed, I believe to be correct. I have found on some occasions, when I did not succeed in doing this as thoroughly as was desired, that in two days' time there seemed to be some elevation of the bone at the point where the ridge had been removed, and I have on several occasions done a supplementary operation, removing a little more bone.

As regards the after-treatment after the removal of ridges or other malformations in the nose in which the bone has been denuded, I have been for years employing the hot carbolized douche. I do not believe this to be the custom generally, but having had such uniformly beneficial results from its use, I do not hesitate to recommend it most heartily. The strength is one teaspoonful to the pint. As regards the window resection operation: It is being greatly modified and improved, and promises to be the operation of the future in a large number of those cases which have been previously operated on in other ways.

I wish to show you a few little things not previously exhibited. One is a little instrument for the introduction of gauze; a second is used in connection with the taking of stitches, where there is a tendency for the membrane to retract or where accidentally a tear is made. This little instrument will help in tying the knot. The third instrument is a special tip for irrigating the nose. It is made of metal, so that it can be sterilized. Fourth, I have modified Dr. Beck's chisel, shortening the blade, and lengthening the shaft.

DR. J. HOLINGER: Dr. Freer makes an L-shaped incision. I do not like it, because it permits the lower flap of the mucous mem-

brane to roll up, which roll later on fails to shrink. As to the ridges, there is very often, as Dr. Stubbs says, a cap of cartilage on top of the bony ridge. If you loosen the mucous membrane and periosteum, and then take out the ridge it sometimes happens that when the two sides of the periosteum fall together you find at the side of the old ridge another one, although not quite as high as the first. This has puzzled me several times. Once after I took out the packing, I opened the sack between the membranes again, and found the cartilaginous cap which was high enough to make it look like the old ridge.

DR. B. HASELTINE: My own experience in the old days when I did sawing operations coincides with that of the speakers who have observed the reformation of ridges. I often used to find the spur returned some weeks after I had made what I thought a good operation. Dr. Beck's contribution gives us the comforting assurance that this is as it should be. The L-shaped incision with the lifting of the flap is one which I was formerly fond of, but recently I have used almost wholly the anterior vertical incision as suggested by Killian. The difficulty and danger of dissecting around sharp spurs I entirely avoid by leaving such dissections until the cartilage is removed. I then insert the bi-valve speculum between the flaps and make the dissection with the field of operation in plain view. In this way all damage to flaps is avoided and postoperative perforations are unknown in my experience.

DR. E. L. KENYON: I suppose we will continue to exercise our judgment in the removal of septal spurs. In spite of the advantages of resection there is no question but that all the gentlemen here will operate on septal spurs in selected instances without raising the concave mucous membrane. The discussion has been limited practically to the non-traumatic cases. There are non-traumatic and especially traumatic cases in which the deflection plays a slight part, and in which the thickening is exceedingly important. Complete extirpation of the thickened bone or cartilage between the two layers of mucous membrane is not the only means of doing away with denuded bone. This is accomplished practically as well by the careful raising of the convex mucous membrane and by preserving it intact, even though the concave mucous membrane be not separated. If this convex elevation be successfully accomplished it is often quite unnecessary to go completely through the septum. Success depends on delicacy of technic. In the cases where the periosteum and perichondrium are

easily raised, there is no difficulty, but in those instances where adhesions are persistent over a large area, the raising of the convex mucous membrane, by whatever flap incision, is a matter of great difficulty. It is here that we fail, and it is here that we ought to study to excel. In proportion as we succeed in obtaining a view of the operative field as clear as that obtained by the general surgeon in operations carried on directly beneath the eye will the technic of this and other processes in nasal surgery become accurate and certain. And it is just here that we owe an additional debt of gratitude to Dr. Freer, whose technic in this respect is a positive advance in nasal surgery.

The instruments employed for the removal of septal projections may be varied in accordance with the experience of the operator. The chisel may be used, or the forceps, or the saw, but no mention has yet been made of the trephine. I presume that many operators use it, and to good advantage, and that there are those who will never abandon it wholly for any other instrument.

As to the necessity of resecting completely the supra-maxillary crest at its base, there is no question in my mind that this is not necessary in all cases. One resects the cartilage above, also the vomer posteriorly when needed, but particularly where the ridge is prominent in front one removes most of this anterior low thickening with the trephine, and obtains practically a perfect result, and with great reduction in the difficulty of the technic. The instruments for septal work now on the market, notably the Freer set, have one quite unnecessary defect, which could easily be remedied by the united action of such a society as this. The handle of these instruments is so thick that the view of the surface operated on is obstructed, particularly when the anterior opening is narrow. The reason for this is that there is a standard form made by manufacturers which is almost universally employed by instrument-makers because of its cheapness. We might prevail on manufacturers to make this basal form thinner, and thus regularly prevent so much interference with the view by the handle of the instrument.

DR. HENRY GRADLE: My experience dates back to the days when Bosworth first recommended the sawing operation, and I saw many operations done, by others as well as by myself. There is no question but what some of them were perfectly satisfactory. Where we dealt with the septum, which was but little deflected, or not at all, where the spine was tolerably sharp and well-defined, and not very broad, the sawing operation would occasionally yield perfectly satisfactory results.

The denudation of the bone is not always a great obstacle to healing, and in many instances fairly smooth healing took place, but after all, this occurred only in the minority of cases, and in a still smaller minority did we get permanently satisfactory results. Very frequently the immediate result seemed to be all that could be desired, but in a month or two the old condition was restored nearly as badly as before, because we did not take out the matrix of the condition. According to Zuckerkandl, these spines are all due to displacement of the bone on the cartilage or the cartilage on the bone, or the growth of a strip of cartilage left in the groove of the bone, and if that is not taken out completely, under the stimulus of a persistent catarrh, new formations will occur and the former condition is restored, even after very satisfactory sawing operations.

I remember an extreme instance in a girl of thirteen, where I did a sawing operation, apparently with good result at the time. Later, a second operation was done by another doctor, with a similar temporary result, and a third operation was even finally required and done by myself. The result then was permanent after a year, but whether patency was eventually maintained I now question. I do not believe that newly-formed cicatrical mucous membrane is always a source of irritation. This is true in some cases, at least temporarily, but not always.

If we compare the results of then with the results of now from the submucous operation, there is no question that the latter deserves preference in every instance except in a small number of cases where we deal with a sharp circumscribed spine on the upper edge of the vomer, reaching nearly to the posterior end. In these cases it is really very difficult to dissect off the mucous membrane satisfactorily. It is even impossible when the edge of the spine is quite sharp, and in such cases, if the spine has not a very broad base, the chiseling operation, even with the sacrifice of a small amount of mucous membrane over the base of the spine gives satisfactory results. Provided we use the chisel and not the saw, it is practically as good as if we retained the mucous membrane, although the healing is never as quick. But it is only in such cases where it is difficult to dissect off the mucous membrane around a well-defined sharply apiced spine that I would consider the chiseling operation without previous dissection of the mucous membrane justifiable.

I would also like to call attention to the sharp spines which burrow into the mucous membrane. They are not rare, even where

the patient does not complain of obstruction. These spines give considerable trouble. Frequently such patients come with a history of an irritable nose, attacks of sneezing, sudden engorgement, all of which can be accounted for by the presence of a small sharp spine, which ordinarily does not impede the respiratory patency of the nose. Again, this sharp spine has an important relationship to proliferative catarrh of the middle ear. My observation has been so frequent that I have reason to doubt the relationship. I have so often found the greater deafness, or one-sided deafness, on the side of such a spine. Of course, we cannot prove the connection theoretically in all instances, because, as a rule, it is a question of permanent damage and removal of the spine will not restore the hearing. Instances are not uncommon, however, where, when we get rid of the irritation the deafness has ceased to be as markedly progressive as it was before the removal of the small but significant sharp spine, and the other ear symptoms, for instance the stopped-up feeling, disappear.

DR. A. M. CORWIN: There are one or two points which I would like to accentuate. First, the one referred to by Dr. Holinger, as to the matter of the sharp ridges. There is often a little nucleus of cartilage at the apex of a sharp spur of deflection, especially where these are low down anteriorly, involving both bone and cartilage. After a submucous resection such thickened periosteum and cartilage, remain as a slight projection, which tends to the reformation of a spur. It is my custom to snip these off. The ample convex flap readily covers the hiatus, in the healing process.

Then as to the matter of cutting through the sharp crest. Each operator will continue to individualize his technic. In one case he may use a small trephine, in another the chisel, and in still another a saw. The latter is often very convenient for making a partial cut through the base of a thickened deflected crest before breaking it off with forceps. To say that any one instrument should always be used, the *sine qua non* for compassing the work of a given indication is to speak with unwanted narrowness. The vital matter in reducing a deflection is to do away with the deviated crest below. If we do not, the operation is but half a success. So, too, the deviation must be reduced sufficiently above or the membranous septum after repair will still hang from the projecting line of the deviation, and the deformity is but partially corrected.

There is one point which I brought out in a paper before this body a number of years ago, which I think has been overlooked in the present discussion. There are noses which present in the cartilaginous part a deflected surface above which is almost a flat, plain surface from above down and outward. There is, I think, no need to remove this; a decent conservatism bids us save bone and cartilage where it can be done with expedition. Especially is this the case at the upper and interior part of the nasal partition where cartilage is put for a purpose. It has been my practice in such cases to introduce high up in front a submucous knife, something after the pattern devised by Ingals some years ago, but which I have modified, making a long, narrow shank, slightly curved and having a small projection like that of a crochet needle, its cutting edge being on the distal or traction side. This knife is entered on the flat anteriorly through a preliminary slit made with a bistoury. This sub-mucous knife is thus worked upward and back under the perichondrium. It is then turned so that the latterly point pierces the cartilage and is drawn forward, dividing the cartilage by submucous incision. One or two such cuts close together reduce the resiliency of the cartilage, allowing the flap of cartilage to be saved, covered by normal mucous membrane and perichondrium to swing down into line when it has been severed posteriorly, below and in front, and the rest of the deflected septum reduced in the usual fashion.

My point is that in selected cases it is needless to remove a larger amount of cartilage when it can be preserved so easily. The resulting septum is strengthened at its weakest place by so much.

DR. F. GURNEY STUBBS (closing): It is now almost seven years since I first started to do a submucous resection for deflections. In that time I have had a varied experience with all sorts of septums, and it was not long before I was puzzled why in so many instances I found this long, narrow strip of cartilage passing back along the vomer—perpendicular-plate junction. The reason for this became apparent when I went back to the embryologic development of the septum, which really gives us the only true understanding of why we have those deflections. I do not believe that there are so many changes taking place later on in life as Dr. Freer would have us believe; most of these are due to the fact that the cartilaginous parts do not fit accurately into the grooves, and in some cases the strip of cartilage, which should be included in the canal projects laterally. If the piece of cartilage, as shown by

Dr. Holinger, is low down it is part of Huschke's cartilage, or the organ of Jacobson. This cartilage is entirely in its own capsule. After removing the cartilage, a knife with rounded edges is required to cut along the edge of the bone, and then start separation further down.

I will try Dr. Freer's respiratory, although I have found long ago that the knife accomplishes the same thing as easily. As to the question of leaving the mucous membrane or not, I think Dr. Robertson is to be congratulated on the universal success in his cases where the saw was used. It does not agree with my experience. I recall a meeting of the British Laryngological Society several years ago, where Semon related his experiences, which were unpleasant rather than pleasant. He said, among other things, that immediately after the operation he imagined he had a perfect result, but that not long afterward the condition was as bad as before. There is no question but what, where the mucous membrane is sacrificed, there is a greater chance of having these annoying conditions occur.

I have never seen splintering of bone occur, and I have used the chisel as much as anyone. If your chisel is sharp and you use it with caution, you can manipulate it easily, and you will not have a fracture occurring. Use little force before you attempt to break loose the bone. As to the jarring, that is not worth attention in the argument. We have all stood it from the dentist before the days of the inlay, and we know that it did not hurt. It is merely unpleasant, and the patient will put up with it as long as it is not painful. The traumatic spur or deflection does not deserve the attention which has been given to it.

The after-treatment is unquestionably shortened where we put back the mucous flap. In a few days we are practically through with the patient. Where the mucous membrane is sacrificed, the patient comes back to us, probably for weeks with an annoying discharge and exuberant granulations. It seems to me that there is more puttering in rhinology than in any other specialty in medicine. Swabbing and irrigating and using an applicator is not only unsurgical, but is likely to produce infection. That is an instance of what is being done in many nasal operations to-day. It is nonsense, and even criminal. It is better to consume a few more minutes in lifting the flap, removing the spur and putting the membrane back. In a few days you have a normal septum and the additional procedure is justified, not only so far as we are concerned, but particularly so far as the patient is concerned.

TORONTO ACADEMY OF MEDICINE.

SECTION OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

November 18, 1909.

DR. R. A. REEVE, Chairman.

PRESENTATION OF CASES

Paralysis of Otitic Origin. By G. WISHART, M. D.

The patient, a male aged 17, with a history of O. M. P., with facial paralysis extending over the fourteen years. Examination showed palpebral fissure widened, brow wrinkles absent; eye could not close; right angle of mouth lower than left; twitching of mouth and nose frequent; sensation of right side of face diminished; mastication fatiguing unless slow and deliberate. No hyperacusis or loss of taste. Contraction with the faradic current good, except in the occipito-front; risorus, buccinator and orbicularis oris muscles. Galvanic reaction sluggish, especially in the superior maxillary region. By direct stimulation the same set of muscles respond much less than those of the eye or the lower jaw.

Radical operation on July 21, 1909. Bone was sclerosed throughout; antrum obliterated; middle fossa unusually low, and the shoulder of the sinus very far forward. The nerve was located and exposed at a point corresponding to the usual situation of the elbow in the floor of the sinus, at which point the Fallopian canal apparently communicated with the middle ear by a fine sinus, occupied by an extension of the thick pyogenic membrane, which lined the middle ear. A farther hiatus in the bony wall was located just above and posterior to the foramen ovale, and was similarly occupied by debris and membrane. The bridge between these was removed and the nerve trunk freed as far as prudence seemed to warrant. Owing to the stress upon the nerve at the time of operation, paralysis became more marked within twenty-four hours, and in addition there was loss of taste in the right half of the tongue, inability to sniff or smell and deviation of the tip of the nose to the left. Since then, as may readily be seen, there has been marked improvement in all the symptoms, indicating that the facial nerve is gradually resuming its normal functions.

DISCUSSION.

DR. GOLDSMITH spoke favorably of the operation, and the good result that followed. The fact that there should be such marked

improvement in the facial paralysis, after it had existed for so many years, should encourage the surgeon to attempt relief by operation, even in cases that seem hopeless.

Fibroma-Angioma. By G. WISHART, M. D.

Boy of fourteen years. History of some months. A tumor the size of a pea, vascular, red and smooth, attached by a broad base to the cartilaginous septum, soft and bleeding readily.

Pathology: The tumor consists of a fine net-work of young fibrous tissue, with numerous thin-walled vessels, and covered with a layer of normal epithelium.

DISCUSSION.

DR. PRICE-BROWN asked how Dr. Wishart intended to operate for the removal of the growth. He should personally prefer to remove it by the use of the electro-cautery.

DR. WISHART replied that he intended to snare off the growth, and subsequently, to apply the electro-cautery to its base.

Submucous Resection with Straightening and Replacement of the Deflected Cartilage—A New and Valuable Method in Cases of Perforation. By P. GOLDSMITH, M. D.

Girl, aged sixteen; very marked deflection of triangular cartilage; angle very acute; submucous resection. Dissection of concave side; patient sneezed, causing a large perforation, which subsequently was further torn. There was also loss of tissue on the opposite side in the other nostril. The operator was thus confronted with a certain perforation. At the outset he had intended to remove the deflection, straighten it and replace it in the nose. This he now did and filled the hole up with cartilage. The edges of the hole in the mucous membrane were flattened down and carefully placed against the replaced cartilage. Healing has been uneventful and we can now see the cartilage in place, though there has not yet been time for the mucous membrane to entirely cover it. Owing to not having anchored the cartilage a slight shifting has occurred, which leaves a small hole unfilled. The cartilage therefore should be anchored to the membrane.

Large Foreign Body Presented, which had Been Removed from the Trachea. By PRICE-BROWN, M. D.

The patient from whom the foreign body had been removed was shown to this Section of the Academy a year ago, wearing a tracheotomy tube. Seven years ago the Doctor had done tracheotomy upon him for the relief of tubercular infiltration of the larynx. The rest to the larynx and out-door life had cured the patient, but the larynx

geal cicatrices were so positive that the esophageal tube could not be dispensed with. He had been taught to take out and replace the tube, after cleaning it, as a sanitary measure. Some months ago, on using a little more force than usual while putting it in place, the cap separated from the tube and the latter slipped down the trachea.

On being summoned, the doctor found the man coughing, and cyanosed and on all fours on the floor. The tube had slipped down to the bifurcation, and judging from the great distress in breathing, together with the color of the patient, he believed it had closed one of the bronchi.

Although he could touch the tube with long-curved forceps, the fit was so tight in the trachea that he could not grasp it with safety; so he placed the patient upon a table, face downwards, and reversed him over the end of it, thus bringing his head to the floor. Then, by manipulation with the fingers while the patient forced a cough, the tube slid back again past the opening. It required two pairs of forceps to remove it, one in the right hand to adjust it so that the end could be seized and the other in the left, with curved blades to grasp the end, when the removal was a simple matter.

DISCUSSION.

THE CHAIRMAN spoke of the lack of acute sensibility which is sometimes manifested when a foreign body is lodged in the larynx. He instanced a case in which a tooth-plate was retained in the entrance of the larynx, producing so few symptoms that removal was not sought for many hours afterwards.

PAPER:

Post-Operative Treatment of Nose, Throat and Ear Cases. By P. GOLDSMITH, M. D.

DISCUSSION.

DR. RYERSON did not agree with the method now so frequently adopted of not following removal of adenoids by after treatment. He liked to treat the side of operation subsequently with boracic acid and some other alkaline disinfectant. He agreed with the reader of the paper in discountenancing too much packing and syringing after mastoid operations.

DR. WISHART could add little to what the reader of the paper had said. After submucous resections, he removes the splint in twenty-four hours. Does not use the collodian dressing in the

vestibule, nor Beck's paste. He believes in simple dressings in all these cases and mild dressings after adenoidectomy.

DR. PRICE-BROWN agreed largely with what Dr. Goldsmith has said in the way of minimum after-dressings. In some points he would go further. For instance in children, after removal of adenoids, he never uses any dressing at all. The free flow of blood after the operation has both a depleting and cleansing effect, washing away in large measure any germ life that may be present. In his experience operations for removal of tonsils and adenoids in these little patients is not followed by elevation of temperature if local after-treatment is avoided; while forcible applications, which the child will always resist, are likely to produce unnecessary and useless abrasions of the raw surface, something which we should avoid. The only after-treatment which he orders in these cases is the administration of a mild cathartic and the giving of warm drinks to keep the throat cleansed.

DR. HUNTER thought that specialists should be more careful than they usually are in the preparation of the patient for the anesthetic and also in the administration of the anesthetic.

DR. BELL related cases of hemorrhage after tonsillotomy in which the patients, although adults, were unaware of the hemorrhage, vomiting at the time proving that the bleeding had been very severe.

DR. McLENNAN agreed with Dr. Price-Brown in the inadvisability of local treatment after removing tonsils and adenoids in children. At Golden Square Hospital no after-treatment was used. He personally does not advise it either in hospital or private practice.

DR. ARDAGH has often had tags after removing adenoids which required after treatment.

The Chairman related a case in which he carefully removed a papilloma from the nose by means of a Jarvis Snare, taking thirty minutes to do it, in order to avoid bleeding. Yet a very severe hemorrhage occurred many hours afterwards. Another case, in which, after operating to remove synechia, the surgeon had placed a tampon. Unwittingly, it was allowed to remain and was removed years afterwards by the doctor.

DR. GOLDSMITH closed the discussion.

